website:http://biz.LGservice.com
e-mail:http://www.LGEservice.com/techsup.html

DLP PROJECTOR
SERVICE MANUAL

MODEL : RD-JT30/31/32/33

CAUTION
BEFORE SERVICING THE PROJECTOR,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



Contents

SAFETY PRECAUTIONS

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

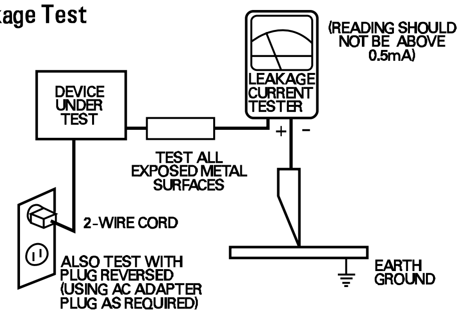
a. Be sure that no built-in protective devices are defective and/or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assemblies in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.**

b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet back, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.

c. **Antenna Cold Check**-With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.

d. **Leakage Current Hot Check**-With the instrument completely reassembled, plug the AC line cord directly into a 120 V AC outlet.
(Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat the test.
ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER.

AC Leakage Test



e. **X-Radiation and High Voltage Limits**-Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original. Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place.
High voltage must be measured each time servicing is done that involves B+, horizontal deflection, or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called "horizontal disable" or "hold-down.") Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the Product Safety & X-radiation Warning note on the service data chassis schematic.
High voltage is maintained within specified limits by close-tolerance safety-related components/adjustments in the high-voltage circuit.
If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning**- Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and will make you, the servicer responsible for personal injury or property damage resulting therefrom.

4. **Picture Tube Implosion Protection Warning**-The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type and number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do not try to remove such "permanently attached" yokes from the picture tube.

5. **Hot Chassis Warning-a.** Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safely serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0 V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground. **b.** Some TV receiver chassis normally have 85 V AC (RMS) between chassis and earth ground regardless of the AC plug polarity. These chassis can be safely serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection. **c.** Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: **a.** near sharp edges, **b.** near thermally hot parts- be sure that leads and components do not touch, **c.** the AC supply, **d.** high voltage, and **e.**antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between components, and between components and the printed circuit board. Check the AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. **PRODUCT SAFETY NOTICE**
Some electrical and mechanical parts have special safety related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, by a ★, or by ⚠ on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement parts might create shock, fire, and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this service manual and its supplements, read and follow the **SAFETY PRECAUTIONS** section of this manual. **Note:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, **always follow the safety precautions.** Remember: Safety First.

General Servicing Precautions

1. a. Always unplug the instrument AC power cord from the AC power source before: (1) removing or reinstalling any component, circuit board, module, or any other instrument assembly. (2) disconnecting or reconnecting any instrument electrical plug or other electrical connections. (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
   Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   b. Do **not** defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
   c. Do **not** apply AC power to this instrument and/or any of its electrical assemblies unless **all** solid-state device heat sinks are correctly installed.
   d. Always connect a test instrument's ground lead to the instrument chassis ground **before** connecting the test instrument positive lead.
   Always remove the test instrument ground lead last.

Note: Refer to the Safety Precautions section of this manual.

2. The service precautions are indicated or printed on the cabinet, chassis, or components. When servicing, follow the printed or indicated service precautions and service materials.
3. The components used in the unit have a specified flame resistance and dielectric strength. When replacing any components, use components which have the same ratings. Components identified by shading, by ★, or by ⚠ in the circuit diagram are important for safety or for the characteristics of the unit. Always replace with the exact replacement components.
4. An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install them as they were.
5. After servicing, always check that the removed screws, components, and wiring have been installed correctly and that the portion around the service part have not been damaged. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

INSULATION CHECKING PROCEDURE

Disconnect the attachment plug from the AC outlet and turn the power on. Connect the insulation resistance meter (500 V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1 Mohm.

Note: Accessible conductive parts include metal panels, input terminals, earphone jacks, etc.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

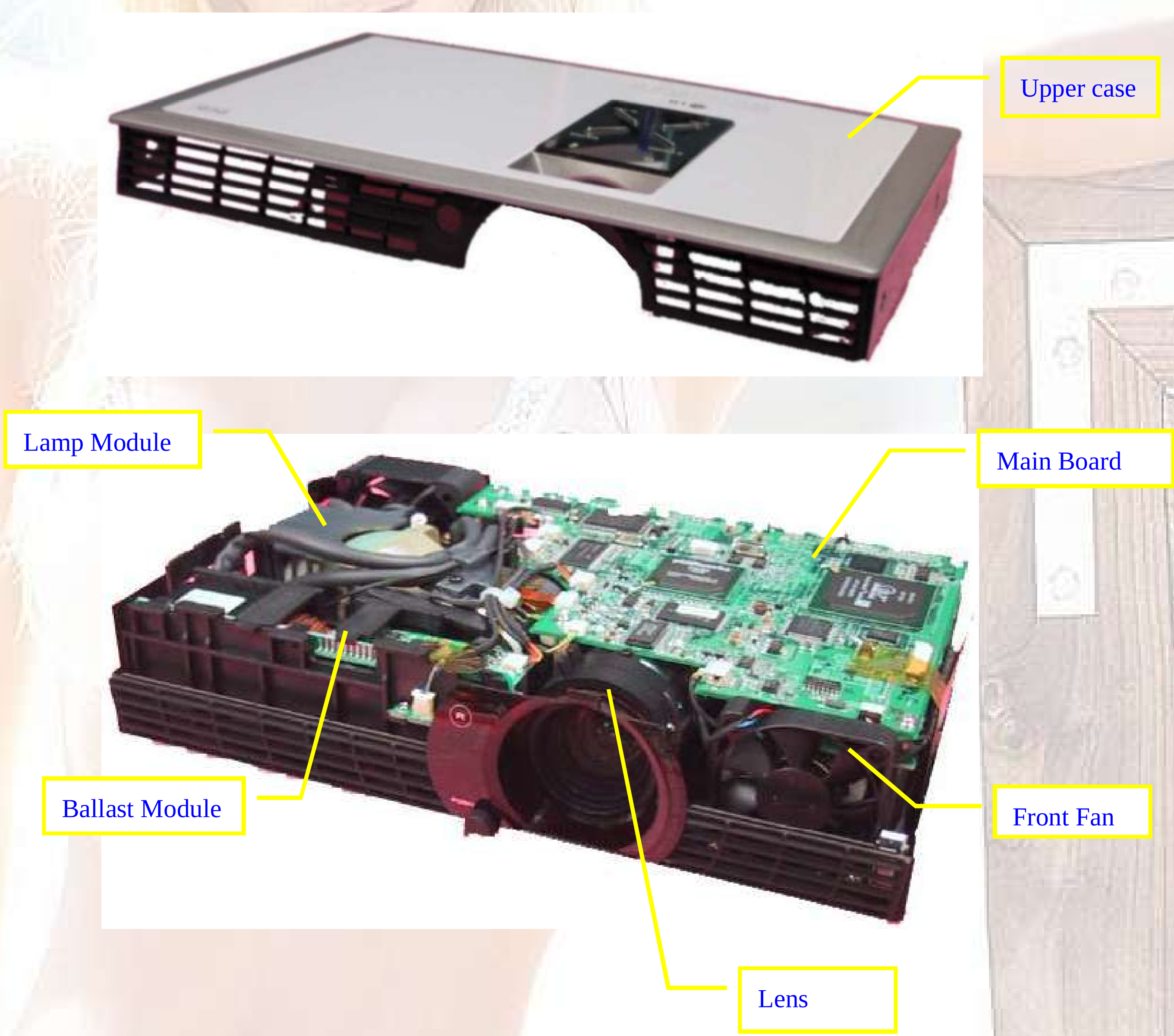
Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

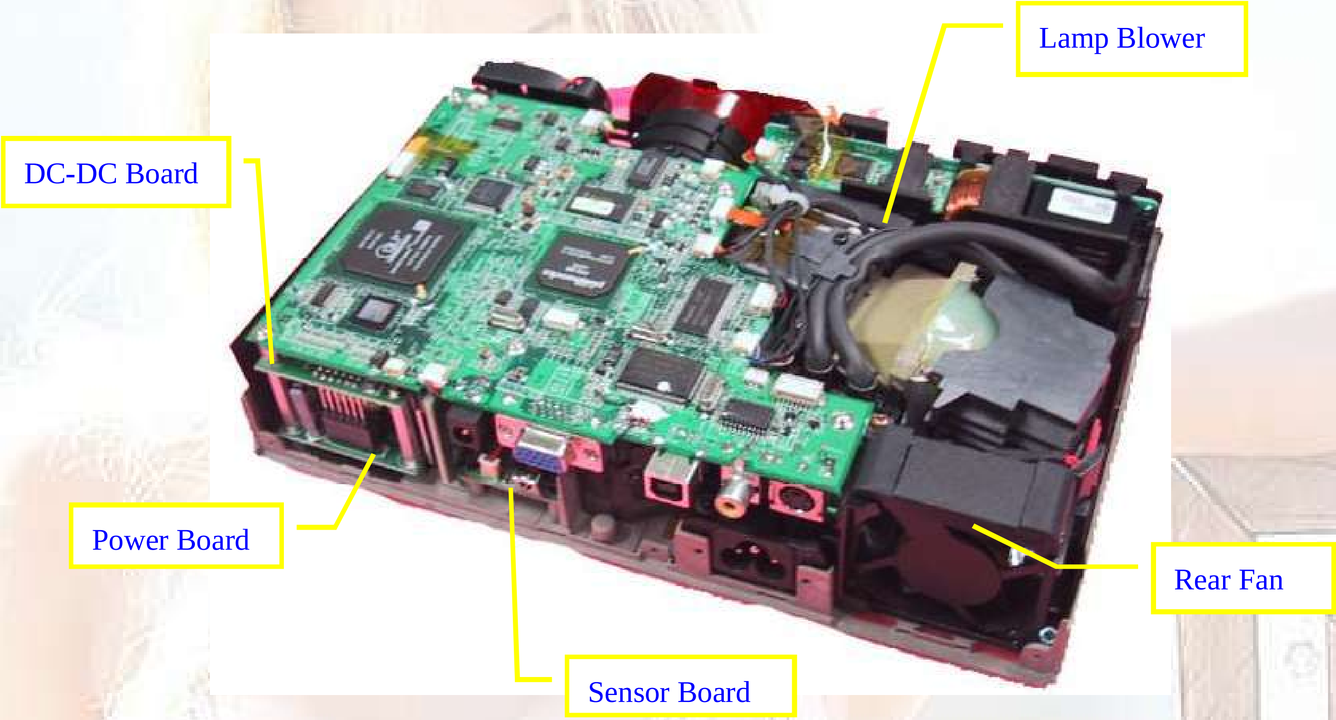
1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on the body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install t.(Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replace ment ES devices. (Otherwise, seemingly harmless motion, such as the brushing together of your clothing or the lifting of your foot from a carpeted floor, can generate static electricity sufficient to damage an ES device.)

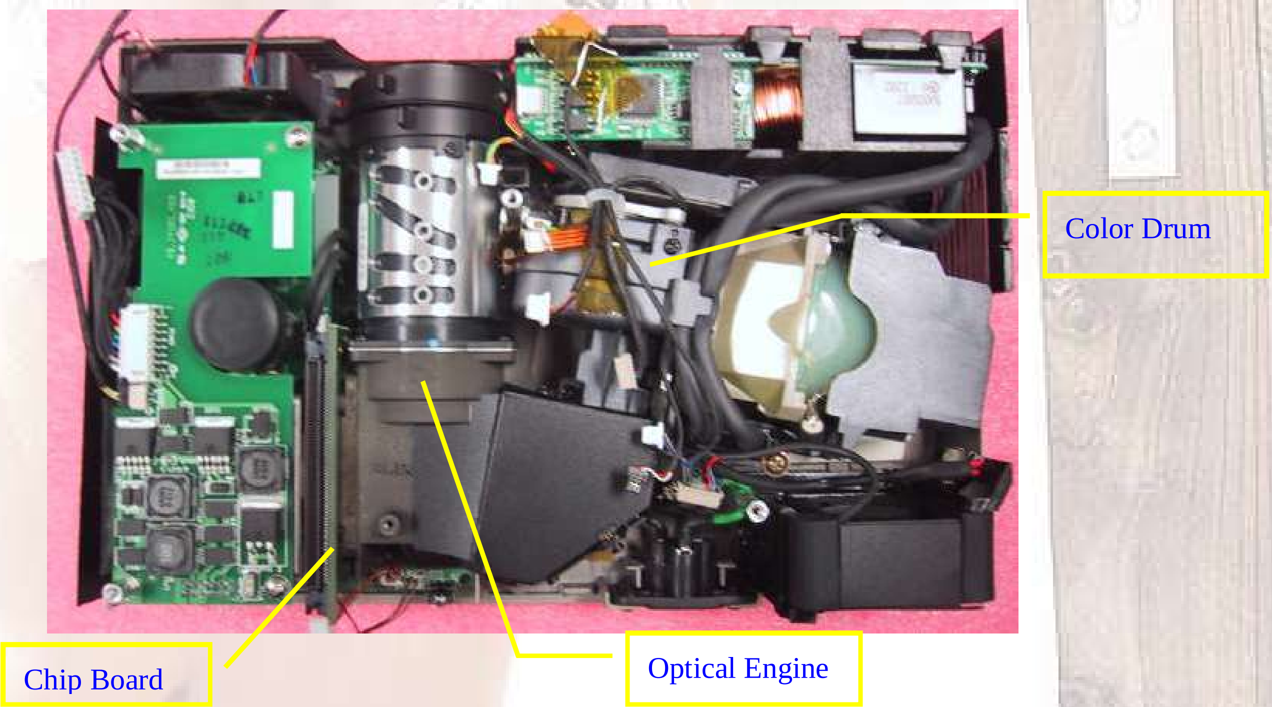


4. Exploded View

The top illustration shows the parts from the front of the projector. The illustration on the next page shows the parts visible from the rear of the projector. To see exploded views of the case parts, major components and optical engine.




Lamp Blower
DC-DC Board
Power Board
Rear Fan
Sensor Board


Color Drum
Chip Board
Optical Engine

5. Replacement Parts List

LG RD-JT30 99.J4977.L31

NO.	BenQ P/N	LG P/N	DESCRIPTION
1	55.J4906.001	6871VSN256A	PCBA CHIP/BD LG JT30
2	60.J4910.001	3680V00113A	ASSY LENS C1,C2 JT30 PROT
3	60.J4911.001	5018V00071A	ASSY FOLD MIRROR MODULE JT30
4	60.J4912.CL1	6912B22006A	ASSY CSD RD-JT30 LAMP MODULE
4-1	35.81J49.001	3680V00111A	Glass front UVAR JT30 PROT
5	55.J4922.001	6871VSN257A	PCBA SENSOR/BD LG JT30
6	65.J4905.011	3680V00112B	COLOR DRUM 35MM 90DEG JT30
7	65.J4901.011	3680V00116A	PROJECTION LENS ZOOM JT31 CO
8	71.07XGA.B00	6871VSN271B	IC DMD 0.7XGA DDR 12
9	42.J4918.001	3720V00206A	CVR LEFT ABS Y7006C JT30
10	42.J4919.001	3720V00207A	CVR RIGHT ABS Y7006C JT30
11	54.J4913.001	5020V00811A	KEYPAD BD/JT30
12	55.J4901.001	6871VMN657B	PCBA MAIN/BD LG JT30
13	55.J4905.001	6871VSN259A	PCBA DC-DC/BD LG JT30
14	55.J4911.001	6871VSN261A	PCBA PFC/BD LG JT30
15	55.J4924.001	6871VSN260A	PCBA REAR IR/BD JT30
16	60.J4901.001	3580V00093B	ASSY FRONT DOOR JT30
17	54.J4912.001	6316000005A	BALLAST PHG151G14 USHIO JT30
18	55.J4908.001	6871VSN260B	PCBA IR/BD LG JT30
19	60.J4905.001	3110V00320B	ASSY UPPER CASE JT30
20	60.J4906.001	3720V00205A	ASSY REAR COVER JT30
21	60.J4907.001	3110V00321A	ASSY LOWER CASE JT30
22	60.J4908.001	3580V00094A	ASSY LAMP DOOR JT30
23	44.J0502.181	3890V01751C	CTN 415X325X255 LG JT30
24	47.J4908.001	3920V00533B	CSN RIGHT JT30
25	27.01218.191	6410VWH015D	CORD H03VV-F3G(MI) 2500MM CEE
26	27.01418.011	6410VWH015H	CORD H05VV-F(MI*3)6A250V S-AF
27	27.02718.201	6410VWH015E	CORD H05VV-F(MI) 10A250V2500U
28	27.04318.031	6410VWH015F	CORD VCTF3G(MI)7A125V 1800 T-
29	50.73213.501	6851V00021N	CABLE 4P USB A-B 1800MM BLACK
30	50.J2401.001	6851V00021U	CABLE D-SUB/RCA 1800MM/SL705X
31	50.J2403.501	6851V00021P	SIGNAL/C 15/15P (-9) 2500MM

32	50.72918.001	6851V00021R	CABLE A/V RCA(R,W,Y)1500MM
33	50.72920.011	6851V00021V	C.A MIN-DIN 4P S-VIDEO W/S 15
34	98.J5501.001	6710V00086E	REMOTE CONTROLLER LG 6710V008
34-1		3550V00341A	BATTERY COVER FOR REMORE CONTROL
35	98.J1302.041	3880VA0025A	SOFT CASE SL705X LG

LG RD-JT31 99.J5577.L31

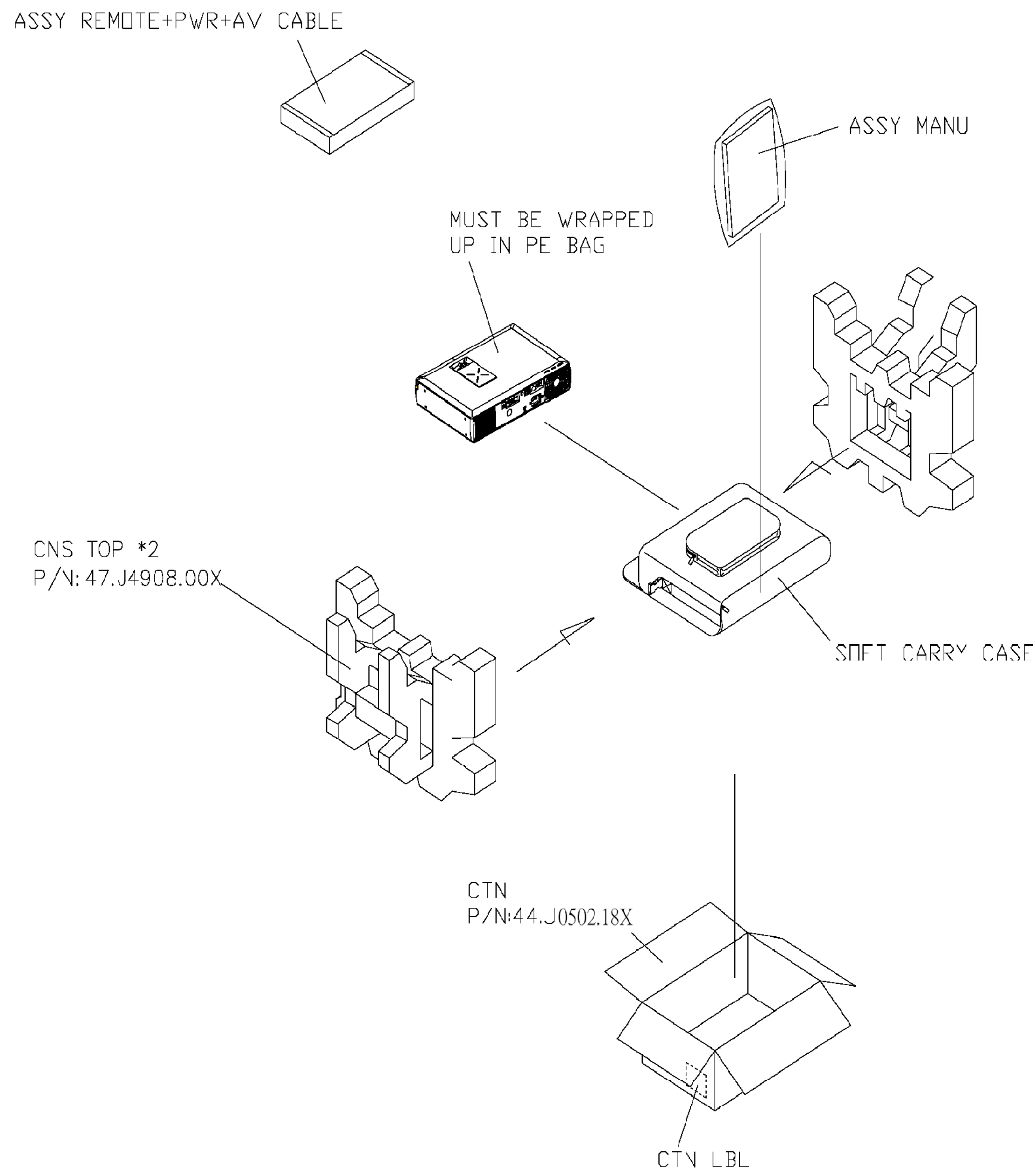
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34-1		3550V00341A	BATTERY COVER FOR REMOTE CONTROL
35	98.J1302.041	3880VA0025A	SOFT CASE SL705X LG

6. Block Diagram



7. Packaging Description



CTN LBL PRINTING:

Model Name: **RD-JT31**

Resolution : **SVGA**

Made in Taiwan

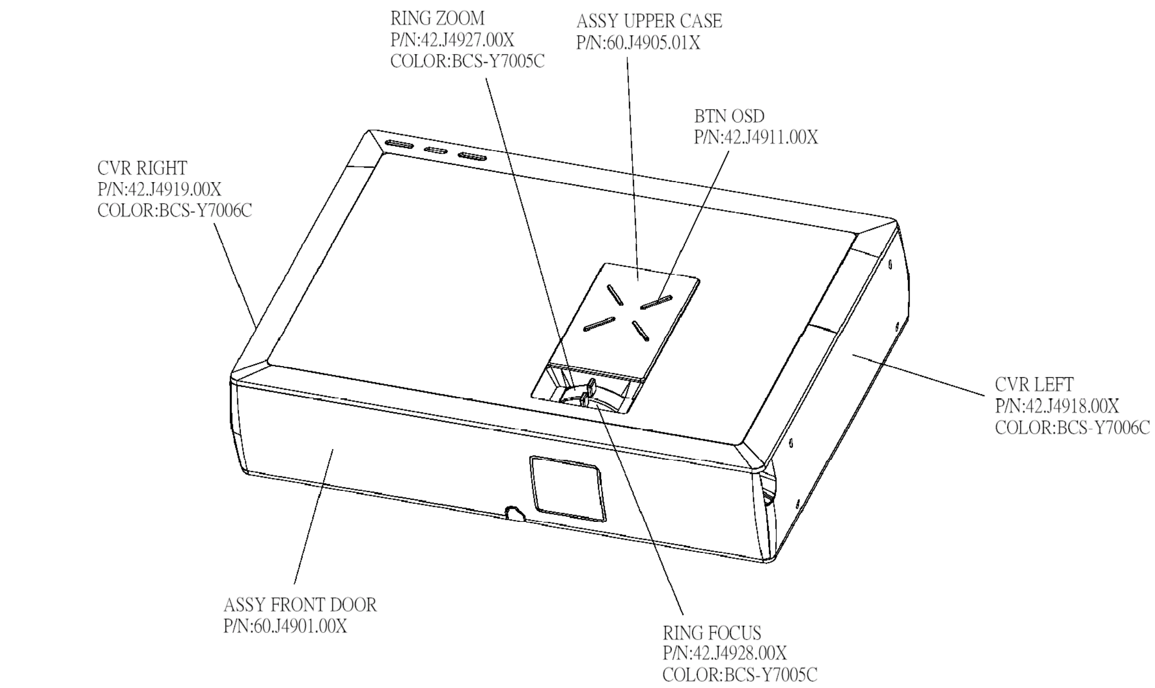
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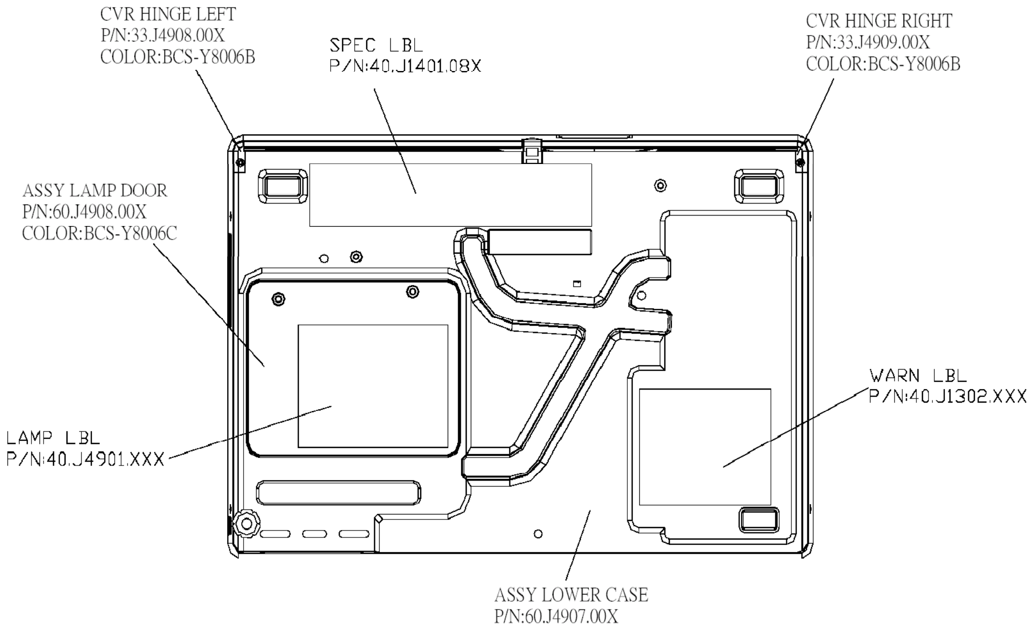
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OTHER

P/N:45.L2701.001

8. Appearance Description

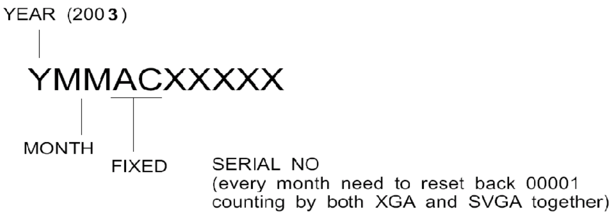




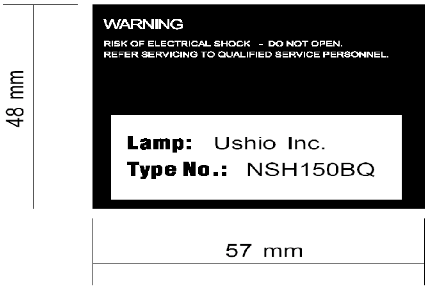
1. SPEC LBL PRINTING



40.J1401.151

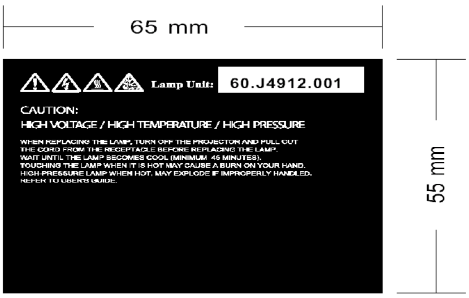


2. WARN LBL PRINTING



P/N:40.J1302.051

3. LAMP LBL PRINTING



P/N:40.J4901.001

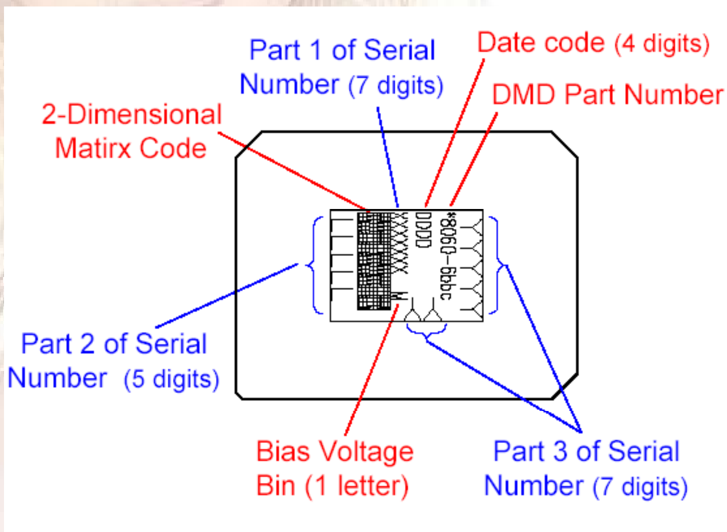
9. Alignment Procedure

1.DMD Bias Voltage Alignment

Equipment:None

Procedure:

Watch DMD "Bias Voltage Bin" Label (Example: 8060-7bbc DDDD XXXXXXX M)



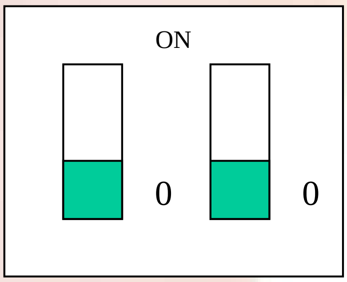
Switch the DIP switch (SW2) on Main board according to the red character on the DMD chip

3. 00: E

01: D

10: C

11: B



2.Color Wheel Delay Alignment

Equipment:

Battery Biased Silicon PIN Detector

Oscilloscope

Probe

Procedure:

Probe impedance matches 50 ohm

Open Factory OSD, and select color wheel delay item

Leave the image pure red (DMD red curtain)

Put the detector on the screen that red image was projected.

Watch the oscilloscope and notice the square waveform

Use the "→" and "←" key to increment or decrement the color wheel delay value

No matter the waveform is square or not, let the waveform was lagged first



Then increment or decrement the value to let the waveform to be square

Do not adjust too much, let the signal get ahead, if it happens, go back to step 7 and do it again.

Change the input to pure blue and repeat the above procedures again.

3.PC Color Alignment Procedure

Equipment:

Pattern generator

Procedure:

Connect power, D-sub, into projector.

Change pattern generator to pattern 43 5-DISC.

Light on projector

Enter factory mode.

Choose ADC Brightness item to Press.

Choose ADC Contrast item to Press.

Change pattern generator to pattern 32 gray bar.

See if any gray level was abnormal, if the abnormality happened, went back to step 4 and then redid it again.

Quit factory mode, after above adjustments finished.

4.HDTV Color Adjustment Procedure

Equipment:

Pattern generator (VG-828)

Lux meter (CL-100)

Procedure:

(a). Offset adjustment:

Black coordinate spec:

	Osram lamp	Oshio lamp
x0	0.281±0.01	0.313±0.01
y0	0.311±0.01	0.329±0.01

The variance of color coordinate via Pb offset and Pr offset:

	x	y
Pb offset↓	x↓	y↓
Pb offset↑	x↑	y↑
Pr offset↓	x↑	y↓
Pr offset↑	x↓	y↑

If we line the x and y, then the Pb offset is the shift action and the Pr offset is the rotational action.

Connect power, YPbPr Video into projector.

Change Timing and pattern of pattern generator :

Timing : 480P(H:31.54 KHz,V:60.08 Hz)

pattern : black

Light on projector

Set user OSD values to default.

Enter factory mode.

Set Factory values to default.

Follow the PbPr offset adjustment flow chart:



5.Optical Engine Assembly Procedure

Note:

1.Every operator must check the dust/chip on every optical component before assembly.

2.Dust remove procedure is defined in document 01.

No.	Stop	Check	Action	Review	Equipment
1.	ROD	Remove dust on ROD			
			Assemble Clip Rod Btm		Screw driver
			Put a little glue on ROD align surface		glue CA064
		Pull the clip backward by screw driver	Assemble ROD		Screw driver
			Assemble clip rod top		
			Assemble clip rod side		Screw driver
2	Assy C1C2 module	Check the followed direction of C1C2 on SOP	Assemble c1c2 module		Screw driver
3.	Assy FM on holder	make sure the direction of mirror is precise	1.Put glue 727 on three slot datum of holder 2.put A649 on the back of mirror 3.Assemble mirror on holder by glue		Glue 727 and Activator A649
4.	Assy FM Module		Assemble FM module on Dmd Hsg with spring and adjust screw washer		Screw driver
		Keep the original position of fold mirror	Control the 1.65mm between Hsg and holder by jig or torgue		Screw driver jig
5.	Assy C3 Lens on Holder Lens C3	Make sure Lens C3 is exactly contacted on related datum of holder	Assemble lens C3 on holder		UV glue and UV gun
6.	Assemble C3 module on hsg		Assemble C3 module on hsg		Screw Driver

7.	Assemble TIR on Hsg	Make sure TIR is exactly contacted related datum of hsg	1. put glue 727 on 4 Hsg Datum 2. Put CA064 on bottom surface of TIR 3. Assemble TIR on Hsg		Glue 727 Activator A649
8.	Assemble Color Drum on bkt	1. Follow the screw torgue 2. avoid straight load toward bearing	Assemble color drum/ bd_sensor on bkt motor mount	Screw torgue 1kgf	
9.	Assemble Color Drum module on HSG	Avoid interfere with ROD during assembling	Assemble Color drum module on Hsg		Screw driver
	Assemble cvr color drum	1.avoid interfere with color drum 2. Make sure CVR's location is correct	Assemble CVR Color drum module on Hsg		Screw driver
		Check interfere after assembling			
10.	DMD Module/Engine Test		Assemble DMD/DMD_BD/ projection lens on Hsg	DMD contact Cspring contact	Screw Driver(M2) for DMD
			Over Fill adjust	Adjust three screws of FM module	
			C/W delay adjust and Engine Test		Senserand Oscilloscope
			Fix FM by glue		Screw Glue

6. Power Alignment

PFC Output voltage

Output voltage range: 340 ~ 410VDC

Output current: 0.025 ~ 0.45ADC

Input voltage: 110VAC or 220VAC, 50 or 60Hz

DC/DC Output voltage

Output voltage	Output voltage range	Output current
+3.3V	3.20 ~ 3.55V	0.5 ~ 1.7A
+5V	4.75~ 5.25V	0.1 ~ 0.15A
+12V	11.9~ 13.2V	0.1 ~ 0.8A

Input voltage (from Line and Neutral): 110VAC or 220VAC, 50 or 60Hz

3. CY690, CY691 Only for reflow soldering. Please pay attention.
   CY690, CY691 are in the 55.J4911.M01

10. How to disassemble the set

1. Lamp Module

The lamp module is located at bottom of the projector. The lamp module behinds the lamp cover with 1 captive screw. After you replace the lamp module, you should reset the lamp hour counter. The switch interrupts power supply output to the projector if you remove the lamp cover.

WARNING Allow the projector to cool before removing the lamp module. The lamp module becomes very hot when the projector is in use. DO NOT touch any part of the lamp module that is located in the lamp box. Oils from your fingers will cause smudges and uneven heating of lamp surfaces, resulting in decreased image quality and premature lamp failure. If the lamp is ruptured or the lamp module is cracked or damaged, be careful of quartz or glass fragments that could cause personal injury.

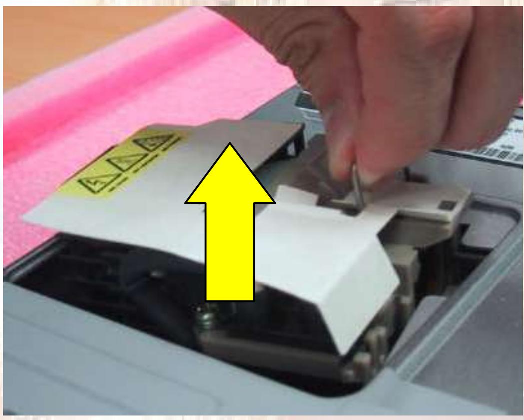
1.Remove two screws of lamp cover which is a spring door.



2. Remove the 1 screw from the lamp module.



3. Grasp the handle on the lamp module and pull the module out of the lamp box.



2. Covers

2.1 Side bezel

1. Remove 4 screws under the projector of left side bezel, then remove it out of projector.



2. Remove 4 screws under the projector of right side bezel, then remove it out of projector.



2.2 Front bezel

1. Remove the 2 screws under the projector of front bezel, then remove front bezel out of projector.



2.3 Rear bezel

1. Remove 2 screws under the projector of bottom bezel.



2. Remove 8 screws and 2 jack screws on the rear bezel.



3. Pull the rear bezel out of projector.

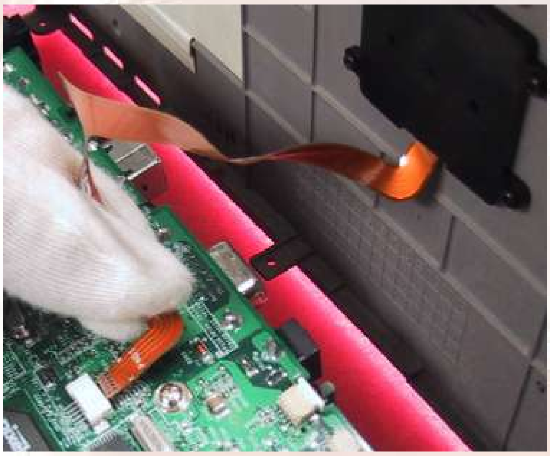


2.4 Upper case

1. Pull the upper case out of projector.

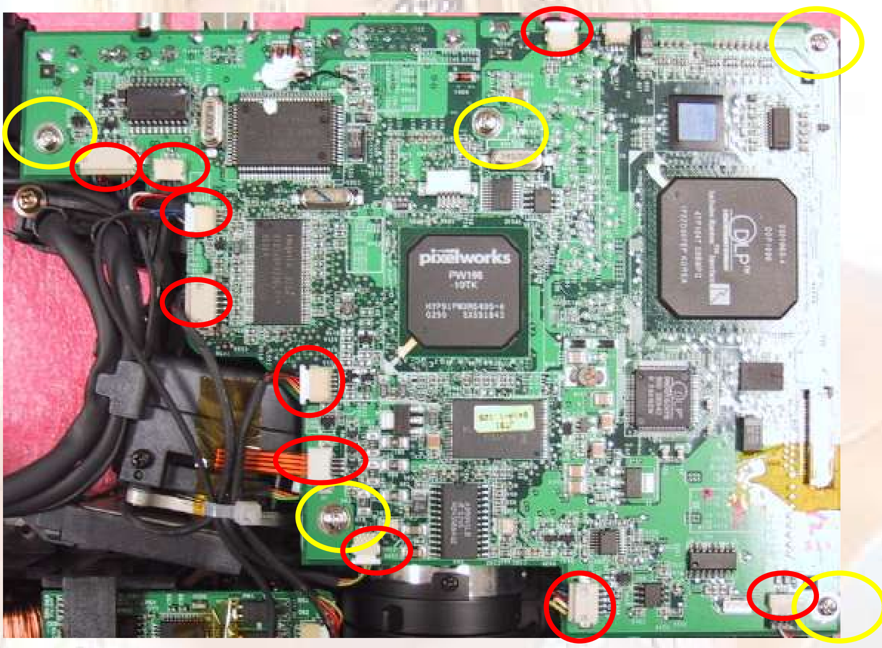


2. Be sure to remove wire of keypad board, then the upper case can be removed.

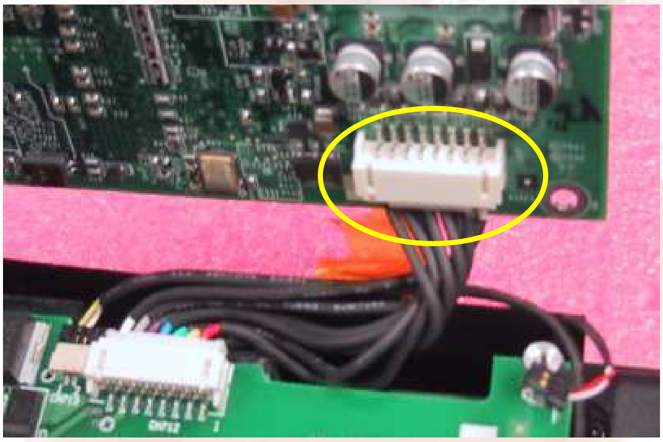


3. Main board

1. Remove 5 screws and 10 wires.



2. Be sure to remove 1 wire, then the main board can be removed.

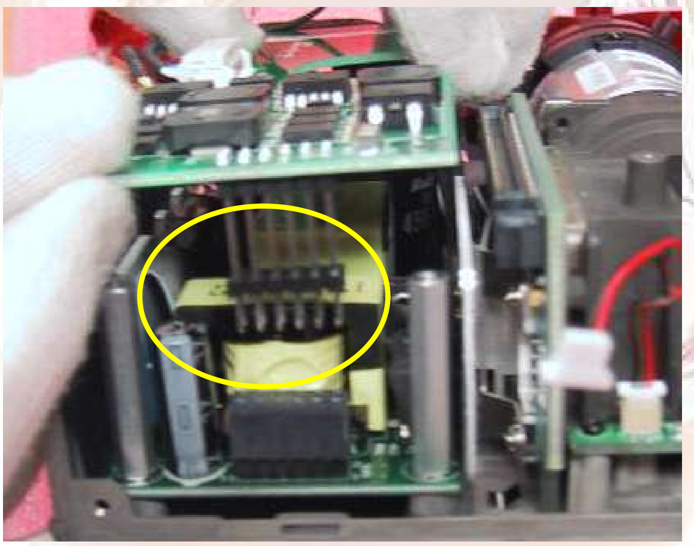


4. DC-DC Board

1. Remove 2 screws, 2 jack screws and 1 wire.

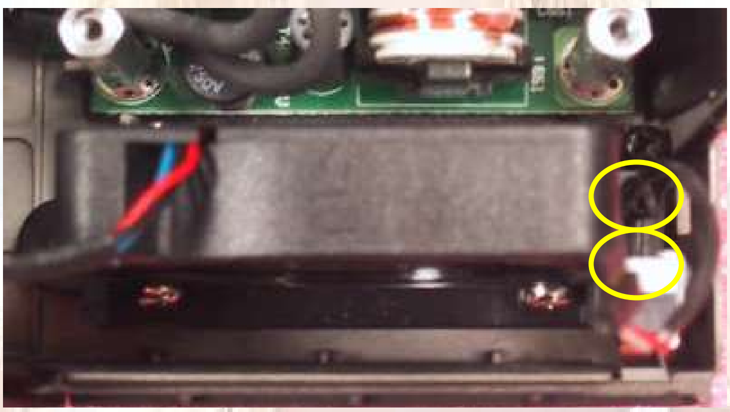


2. Be sure to remove connector from the power board.



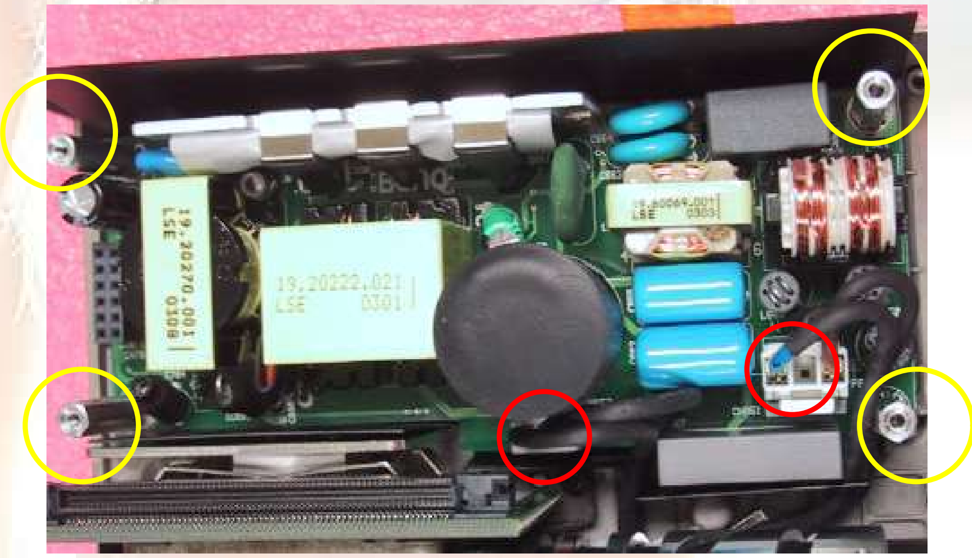
5. Front Fan

1. Remove 2 screws, then the front fan can be removed.



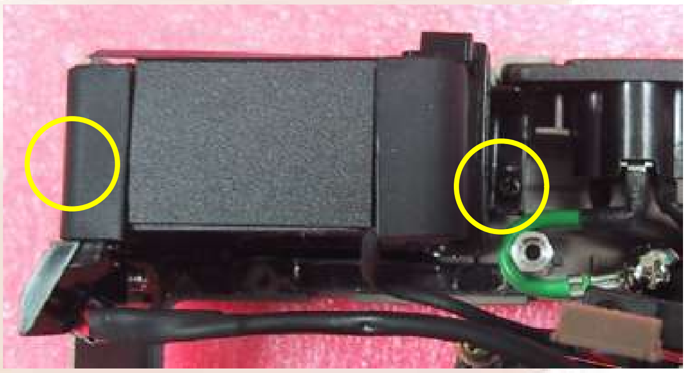
6. Power Board

1. Remove 4 jack screws and 2 wires, then the power board can be removed.



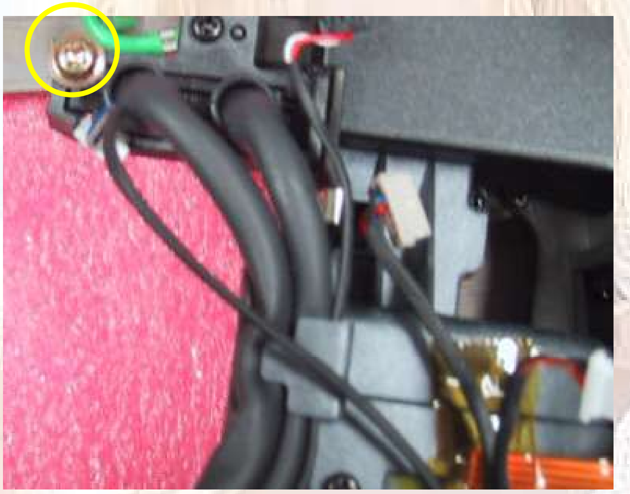
7. Rear Fan

1. Remove 2 screws, then the rear fan can be removed.

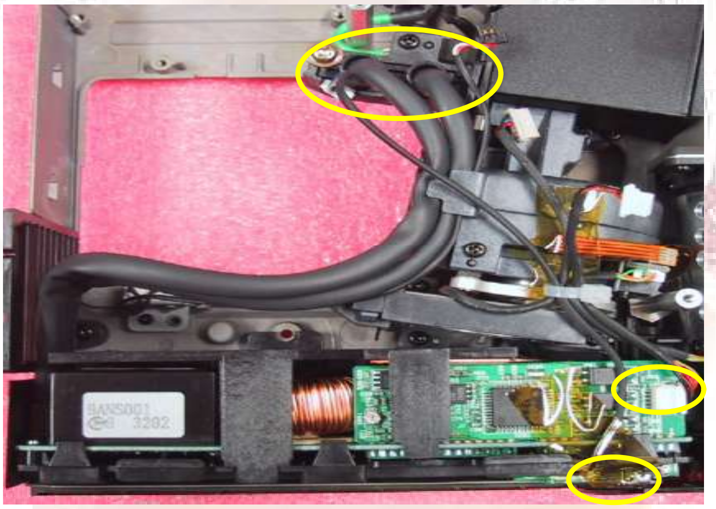


8. Ballast Module

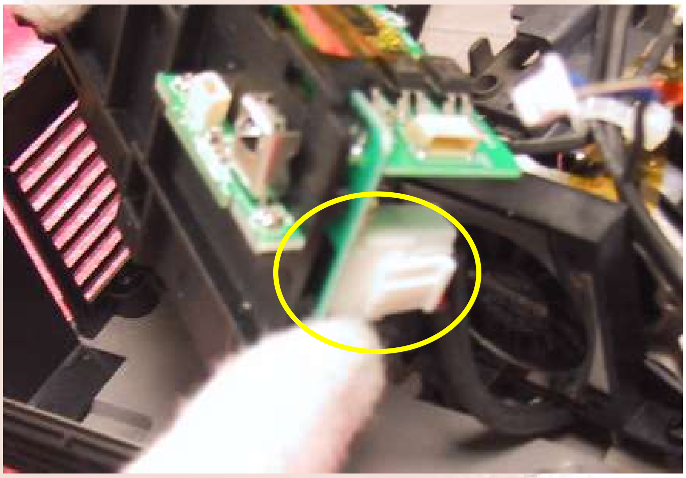
1. Remove golden screw.



2. Remove 3 wires.



3. Be sure to remove 1 wire, then the ballast module can be removed.



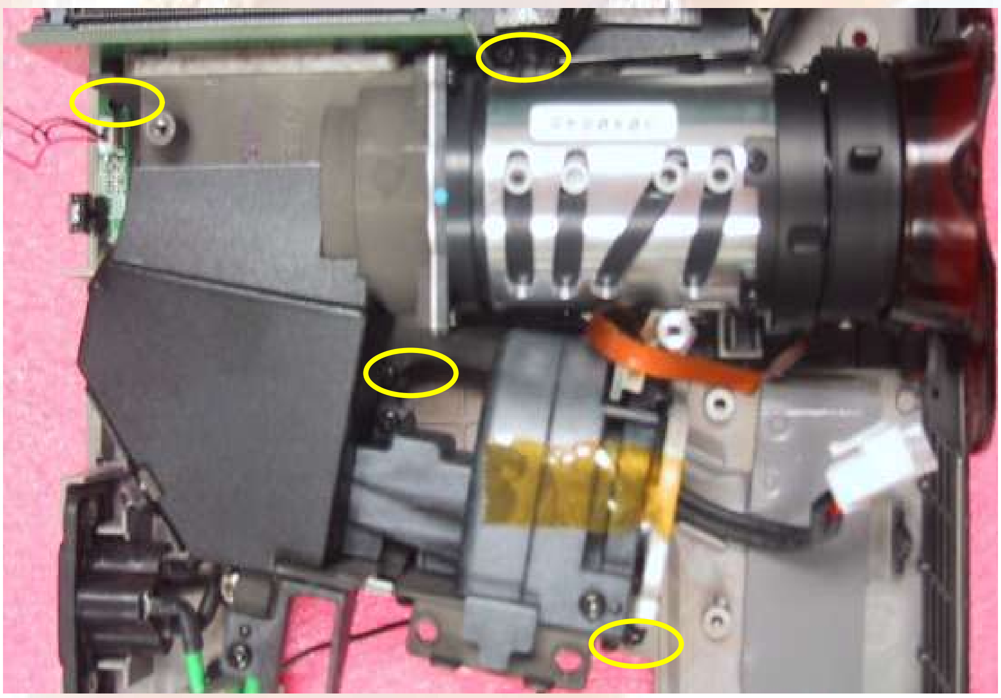
9. Lamp Blower

1. Remove 2 screws, then the lamp blower can be removed.



10. Optical engine

1. Remove 4 screws, then the optical engine can be removed.



11. Frequently Asked Questions

1. Why the unit doesn't power on?

1) Make sure the power cord is inserted into the AC adapter socket.
2) Make sure the power cord is inserted into the power outlet.
3) Wait 90 seconds after the projector is turned off before turning the projector back on.

2. Why the unit has no picture?

1) Check for the proper input source.
2) Ensure all cables are connected properly.
3) Adjust the brightness and contrast.

3. Why the unit has trapezoid image on the screen?

1) Reposition the unit to improve its angle on the screen.
2) Use the Keystone correction key on the remote control unit.

4. Why the unit has poor color?

1) Select the correct video system.
2) Adjust brightness, contrast, or saturation.

5. Why the unit has blurred image?

1) Press Auto on the control panel of the projector or the remote control unit to get better picture quality.
2) Adjust the focus.
3) Reposition the unit to improve its projection angle.
4) Ensure the distance between the unit and screen is within the adjustment range of the lens.

6. Why the remote control doesn't work?

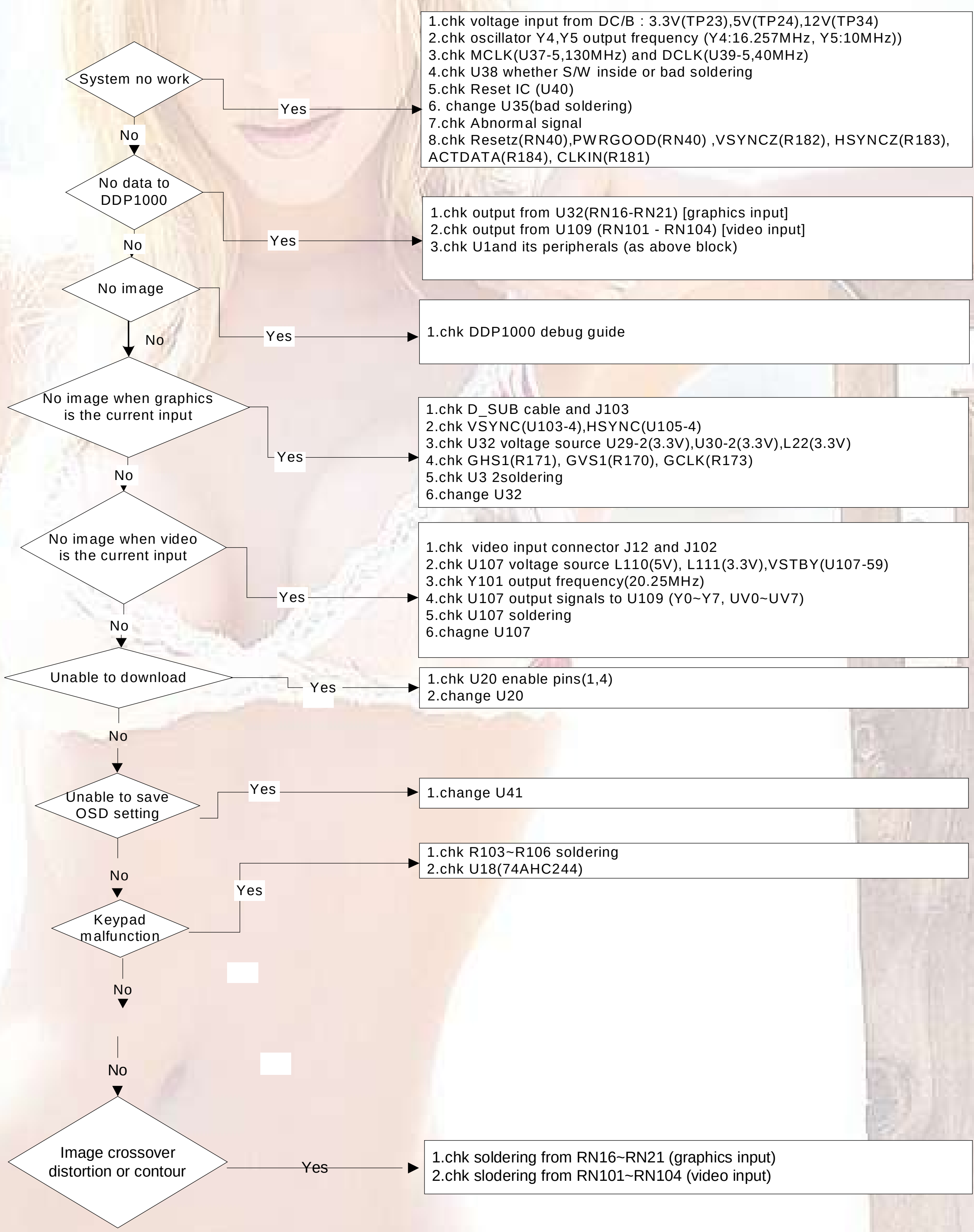
1) Replace the batteries with new one.
2) Make sure there is no obstacle between the remote control and the projector.
3) Make sure nothing is blocking the front and rear receivers.

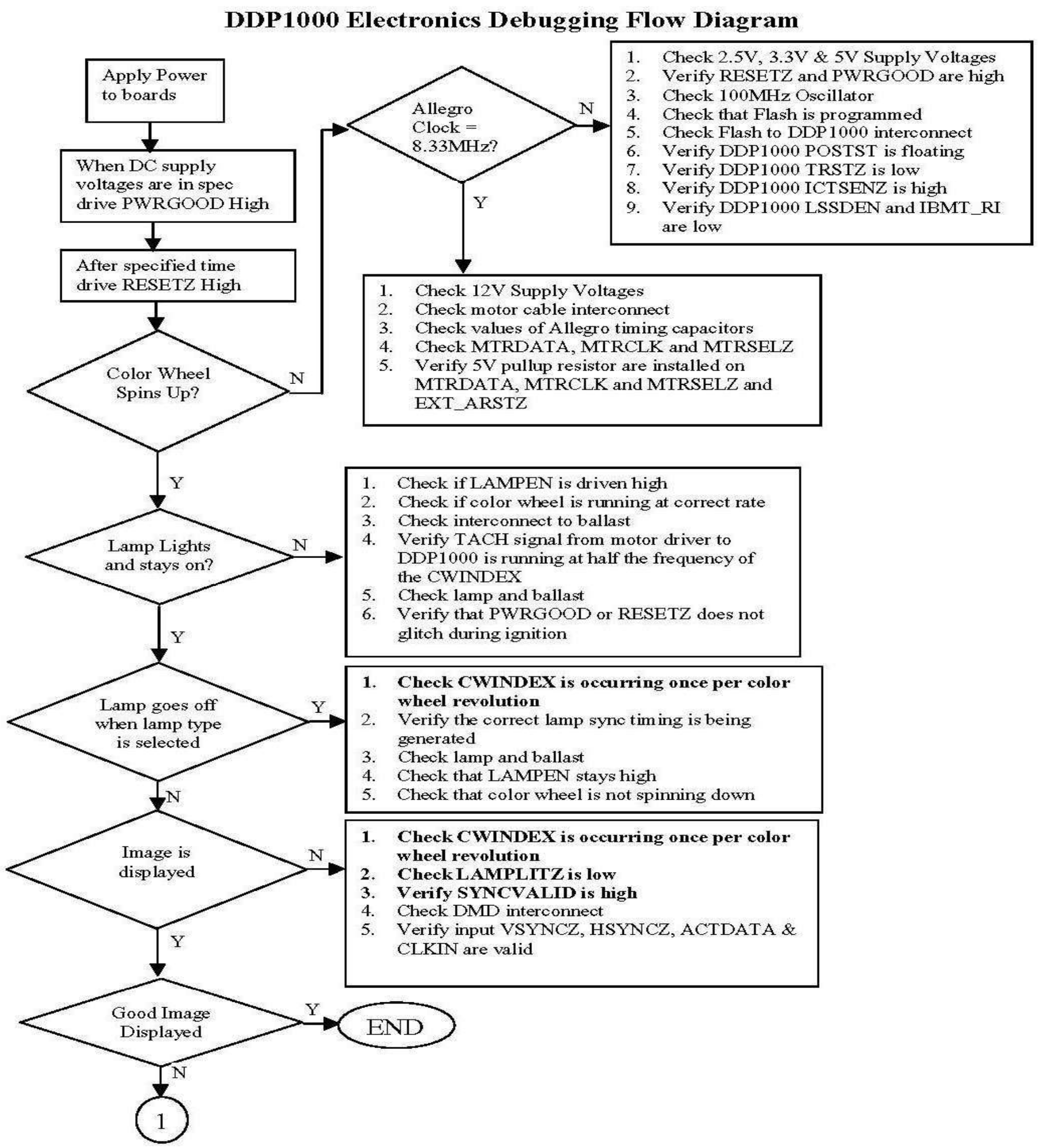
12. Trouble Shooting Guide

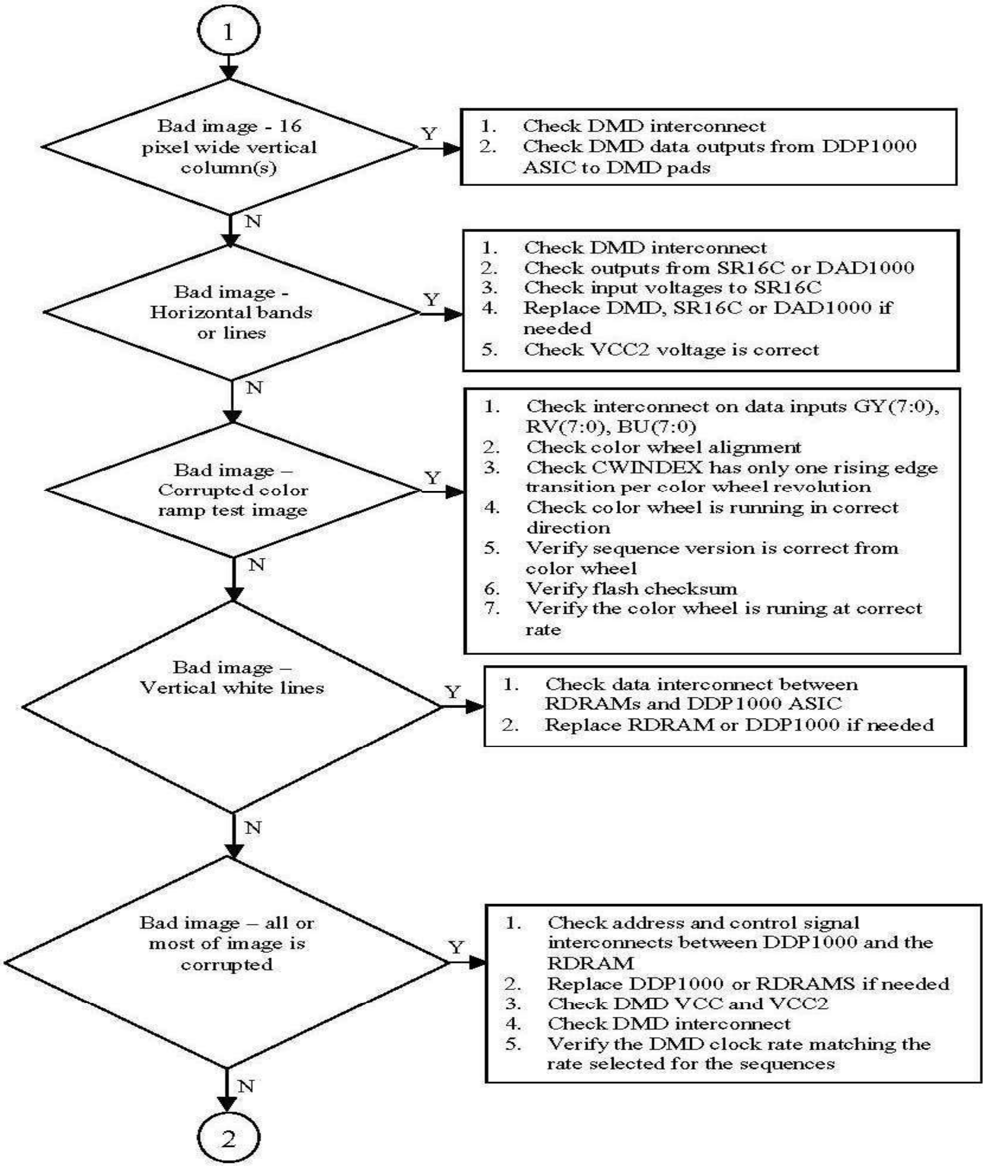
Optical Engine trouble shooting guide

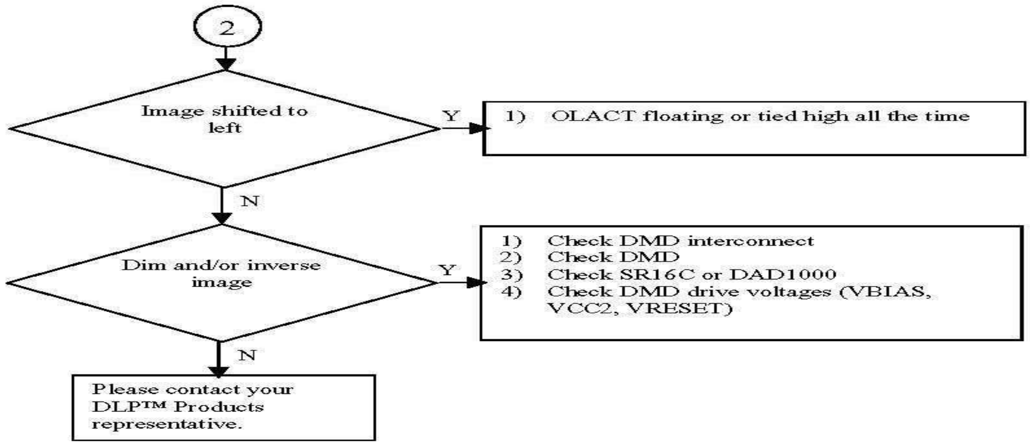
Debug Item	Trouble Shooting Guide
1. Brightness	1.Check EE setting / Follow up EE alignment procedure 2.Check fold mirror position / re-align fold mirror to be closer to design position. 3.Check Rod lens at datum surface / put rod lens at right datum surface 4.Check Green color / If too green and over spec., change color drum 5.Change lamp
2. Uniformity	1.Check fold mirror position / re-align fold mirror to be closer to design position 2.Check lamp / Re-assembly lamp
3. On/Off Contrast	1.Check projection lens clean / To clean projection lens 2.Check TIR and DMD clean / To clean TIR and DMD
4. ANSI Contrast	1.Check projection lens clean / To clean projection lens 2.Change projection lens
5. Color	1.Check Front glass 2.Check color drum 50% point for every segment
6. Color Uniformity	1.Check DMD 2.Check rod output surface
7. Focus	1.Check TIR at datum surface / Change HSG and TIR 2.Check focus by Focus formula Y=-0.00037X+0.002 (X at the front of Screen is – and at rear of Screen is +)/ assembly slim metal sheet on projection lens
8. Dust	1.Clean rod output surface 2.Clean DMD surface

JT31 Electrical Debug Guide




DDP1000 Electronics Debugging Flow Diagram
Apply Power to boards
When DC supply voltages are in spec drive PWRGOOD High
After specified time drive RESETZ High
Color Wheel Spins Up?
N
Y
Allegro Clock = 8.33MHz?
N
Y
1. Check 2.5V, 3.3V & 5V Supply Voltages
2. Verify RESETZ and PWRGOOD are high
3. Check 100MHz Oscillator
4. Check that Flash is programmed
5. Check Flash to DDP1000 interconnect
6. Verify DDP1000 POSTST is floating
7. Verify DDP1000 TRSTZ is low
8. Verify DDP1000 ICTSENZ is high
9. Verify DDP1000 LSSDEN and IBMT_RI are low
1. Check 12V Supply Voltages
2. Check motor cable interconnect
3. Check values of Allegro timing capacitors
4. Check MTRDATA, MTRCLK and MTRSELZ
5. Verify 5V pullup resistor are installed on MTRDATA, MTRCLK and MTRSELZ and EXT_ARSTZ
Lamp Lights and stays on?
N
Y
1. Check if LAMPEN is driven high
2. Check if color wheel is running at correct rate
3. Check interconnect to ballast
4. Verify TACH signal from motor driver to DDP1000 is running at half the frequency of the CWINDEX
5. Check lamp and ballast
6. Verify that PWRGOOD or RESETZ does not glitch during ignition
Lamp goes off when lamp type is selected
Y
N
1. Check CWINDEX is occurring once per color wheel revolution
2. Verify the correct lamp sync timing is being generated
3. Check lamp and ballast
4. Check that LAMPEN stays high
5. Check that color wheel is not spinning down
Image is displayed
N
Y
1. Check CWINDEX is occurring once per color wheel revolution
2. Check LAMPLITZ is low
3. Verify SYNCVALID is high
4. Check DMD interconnect
5. Verify input VSYNCZ, HSYNCZ, ACTDATA & CLKIN are valid
Good Image Displayed
Y
END
N
1


1
Bad image - 16 pixel wide vertical column(s)
Y
1. Check DMD interconnect
2. Check DMD data outputs from DDP1000 ASIC to DMD pads
N
Bad image - Horizontal bands or lines
Y
1. Check DMD interconnect
2. Check outputs from SR16C or DAD1000
3. Check input voltages to SR16C
4. Replace DMD, SR16C or DAD1000 if needed
5. Check VCC2 voltage is correct
N
Bad image – Corrupted color ramp test image
Y
1. Check interconnect on data inputs GY(7:0), RV(7:0), BU(7:0)
2. Check color wheel alignment
3. Check CWINDEX has only one rising edge transition per color wheel revolution
4. Check color wheel is running in correct direction
5. Verify sequence version is correct from color wheel
6. Verify flash checksum
7. Verify the color wheel is runing at correct rate
N
Bad image – Vertical white lines
Y
1. Check data interconnect between RDRAMs and DDP1000 ASIC
2. Replace RDRAM or DDP1000 if needed
N
Bad image – all or most of image is corrupted
Y
1. Check address and control signal interconnects between DDP1000 and the RDRAM
2. Replace DDP1000 or RDRAMS if needed
3. Check DMD VCC and VCC2
4. Check DMD interconnect
5. Verify the DMD clock rate matching the rate selected for the sequences
N
2

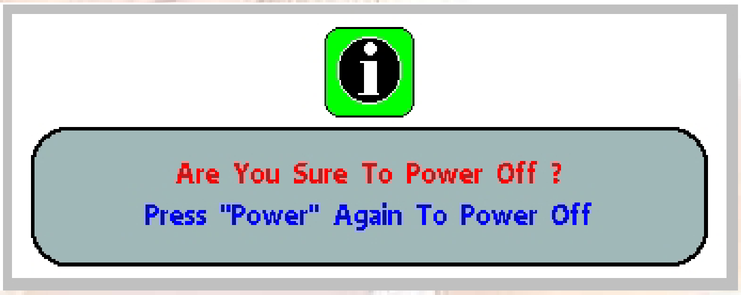

2
Image shifted to left
Y
1) OLACT floating or tied high all the time
N
Dim and/or inverse image
Y
1) Check DMD interconnect
2) Check DMD
3) Check SR16C or DAD1000
4) Check DMD drive voltages (VBIAS, VCC2, VRESET)
N
Please contact your DLP™ Products representative.



13. Service Adjustment Guide

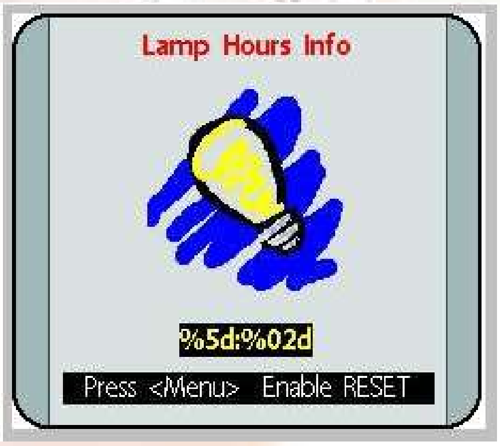
1. How to enter factory menu:

1) Press keypad <Power> key, Enter Power Off check state **(Fig-1)**.



(Fig-1).

2) Press keypad <Source> and <Auto> key simultaneously, enter "Lamp Hour Info" layer **(Fig-2)**.



(Fig-2) Lamp Hours Info

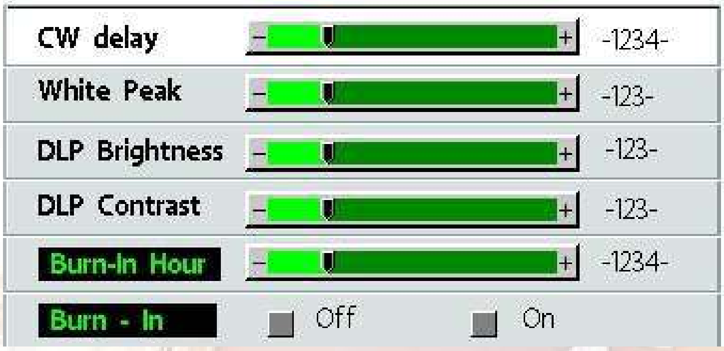
3) Press keypad <Source> and <Auto> key simultaneously again, then enter Factory menu.

WARNING

Note CW delay value in DMD layer and PbPr values in YpbPr Factory control before Upgrade the Software.

2.Factory layer:

1) DMD layer (Fig-3):



(Fig-3) DMD layer

1.1) CW delay: adjust color wheel delay. **(Note this value Before Upgrade Software)**

1.2) White peak: adjust DMD white peak. In PC mode default value set **10**, in Video mode is **0**.Software auto set this value as source find.

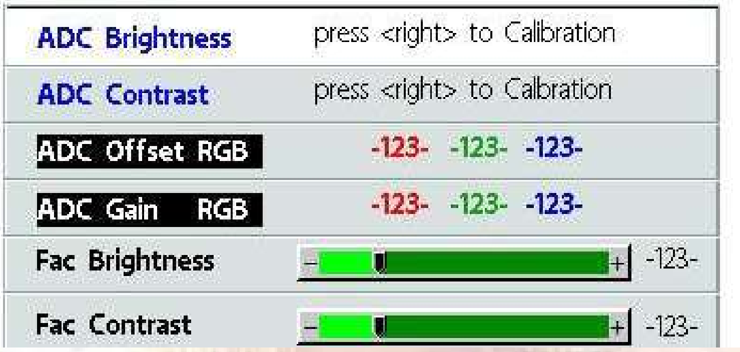
1.3) DLP Brightness: adjust DLP Brightness. default setting is **36**.Do not change this value .

1.4) DLP Contrast: adjust DLP Contrast. Default setting is **30**.Do not change this value.

1.5) Burn-In Hour: set how many hours to burn-in. You can enable burn-in on next selection.

1.6) Burn-In: after you set burn-in hours, set this selection to **On** and system will going to burn-in immediately. You can see color change (red, green, blue, black, white) on screen in turn. System will auto turn off after burn-in hour count down to 0 and burn-in complete. (You can also cancel burn-in sequence by set this selection to **Off**).

2) ADC layer (Fig-4): (only available when input source is analog RGB)



(Fig-4) ADC layer

2.1) ADC Brightness: ADC brightness auto calibration black.

2.2) ADC Contrast: ADC contrast auto calibration white.

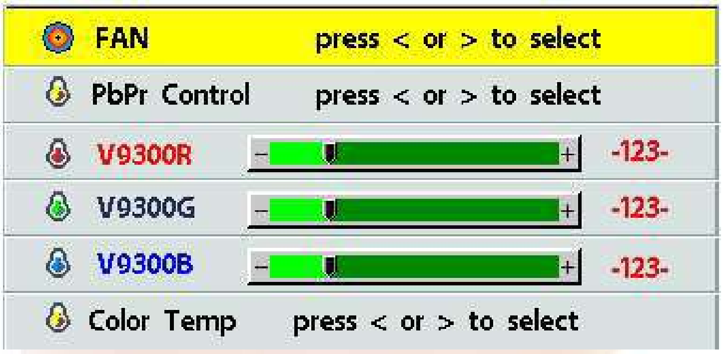
2.3) ADC Offset RGB: value to tell you calibrate result.

2.4) ADC Gain RGB: value to tell you calibrate result.

2.5) Fac Brightness: adjust default brightness value in source PC.

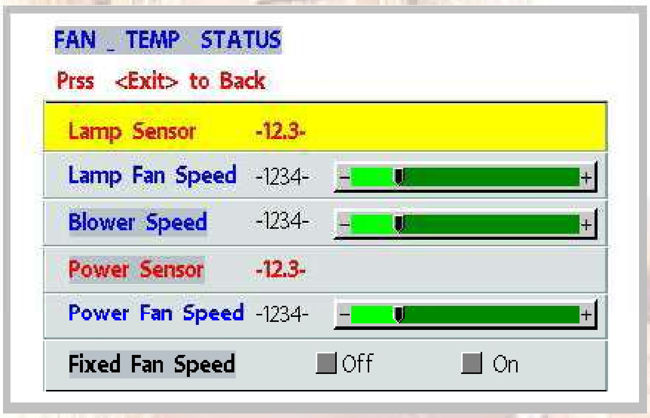
2.6) Fac Contrast: adjust default contrast value in source PC.

3) Color layer (Fig-5):



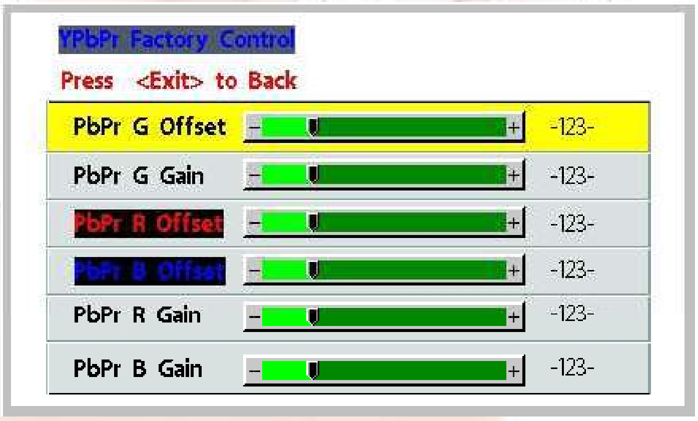
(Fig-5) Color layer

3.1) FAN: enter system fan status info layer.



Lamp Sensor: lamp sensor temperature
Lamp Fan Speed: lamp fan speed in RPM
Blower Speed: Blower fan speed in RPM
Power Sensor: Power sensor temperature
Power Fan Speed: Power fan speed in RPM
Fixed Fan Speed: Disable auto fan speed control and fix fan speed

3.2) PbPr: enter PbPr color control Layer.



When Source is YPbPr (Never Change these setting)
(Note these values Before Upgrade Software)
PbPr G Offset : combine with user osd brightness in YPbPr
PbPr G Gain: combine with user osd contrast in YPbPr
PbPr R Offset: offset of color red
PbPr G Offset: offset of color green
PbPr R Gain: saturation R
PbPr B Gain: saturation B

3.3) V9300R,G, B: Reserve for future use.

3.4) Color Temp: Reserve for future use.

4) Optic layer (Fig-5):



(Fig-5) Optic layer

4.1) Test Pattern: system auto produce pattern for engineer test.

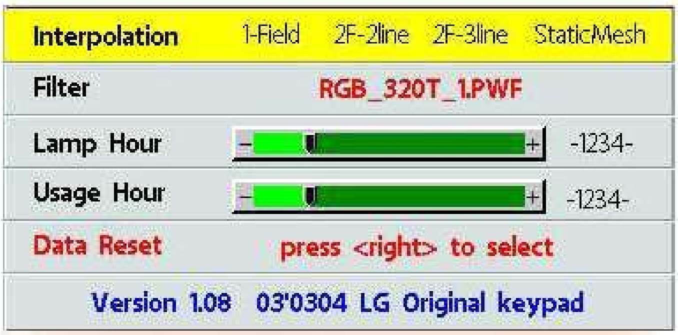
4.2) Spoke light: unit display full white.

4.3) Curtain Red: unit display full color red.

4.4) Curtain Green: unit display full color green.

4.5) Curtain Blue: unit display full color blue.

5) Lamp layer (Fig-6):



(Fig-6) Lamp layer

5.1)Interpolation: De-interlace Mode

5.2) Filter: system auto select Filter.

5.3) Lamp Hour: value to tell you lamp usage hours.

5.4) Usage Hour: value to tell you unit usage hours.

5.5) Data Reset: Reset all data to default include factory assign value.
Never try to reset all data.

5.6) Version: software version.

6) Others layer (Fig-7):



(Fig-7) YPbPr layer

6.1) Gamma index: system auto select DLP gamma index

6.2) Gray value: adjust here to check DMD fail pixel.

6.3) Blue value: adjust here to check DMD fail pixel.

6.4) Scaling: tell you what scaling mode is using now.

6.5) Pc/PbPr Mode: index of input timing

6.6) RS232: Enable / Disable RS232 control

14. Firmware Upgrade Procedure

Step 1

Setup Flashloader in computer.

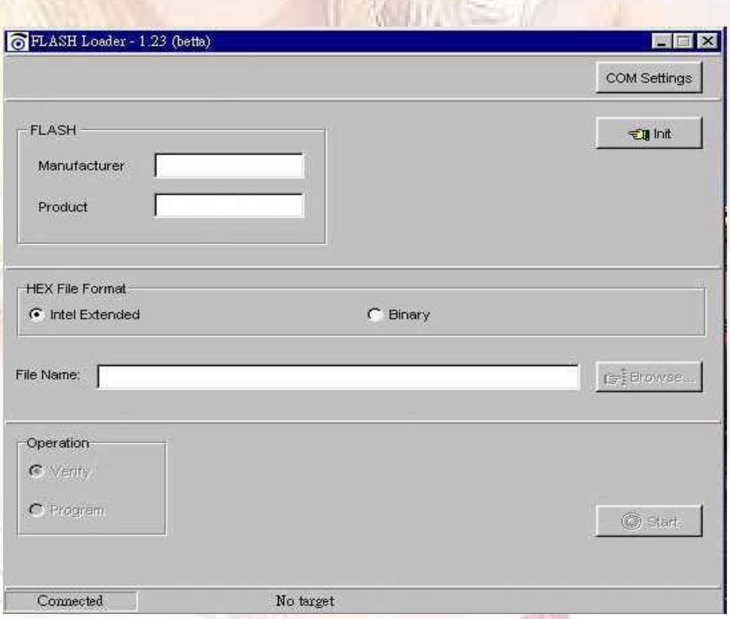
Step 2

a. Connect download cable with computer and projector

b. Connect power cord with projector and check power switch is OFF.

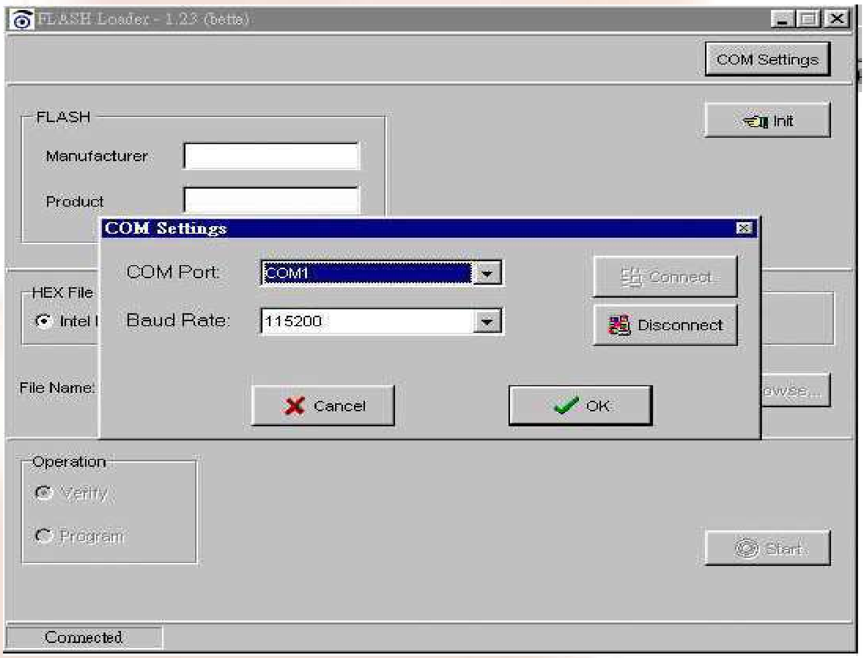
Step 3

Execute FLASH loder.exe



Step 4

Setting COM Port & Baud Rate



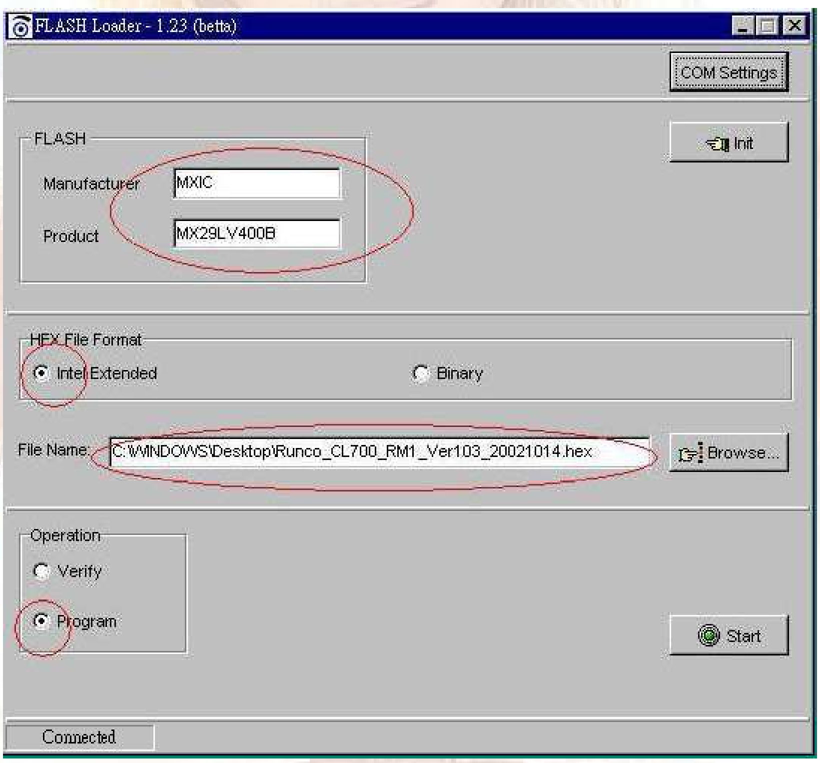
Step 5

a. Turn on the power switch of the projector, then the Program will target the Flash.

b. HEX File Format choose Intel Extended

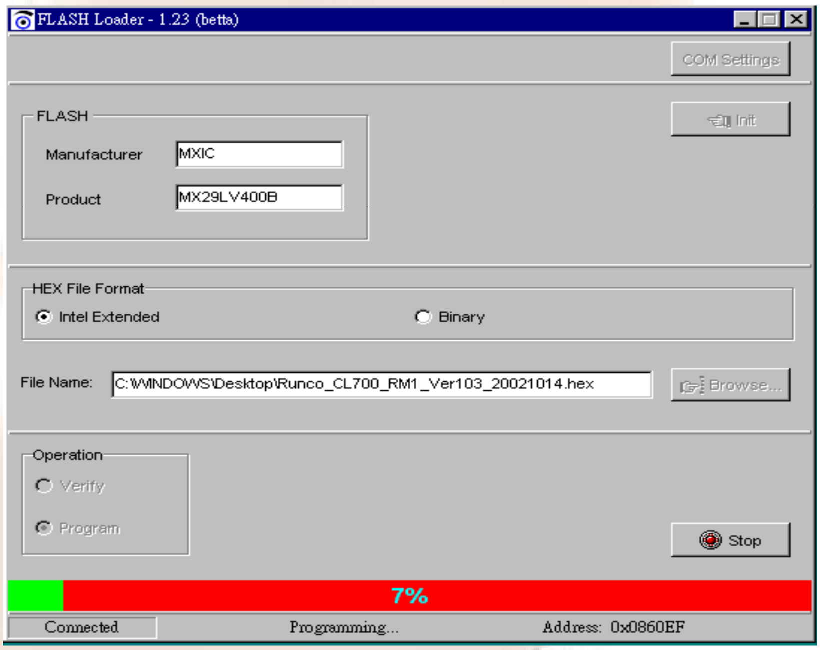
c. File Name choose

d. Operation choose Program



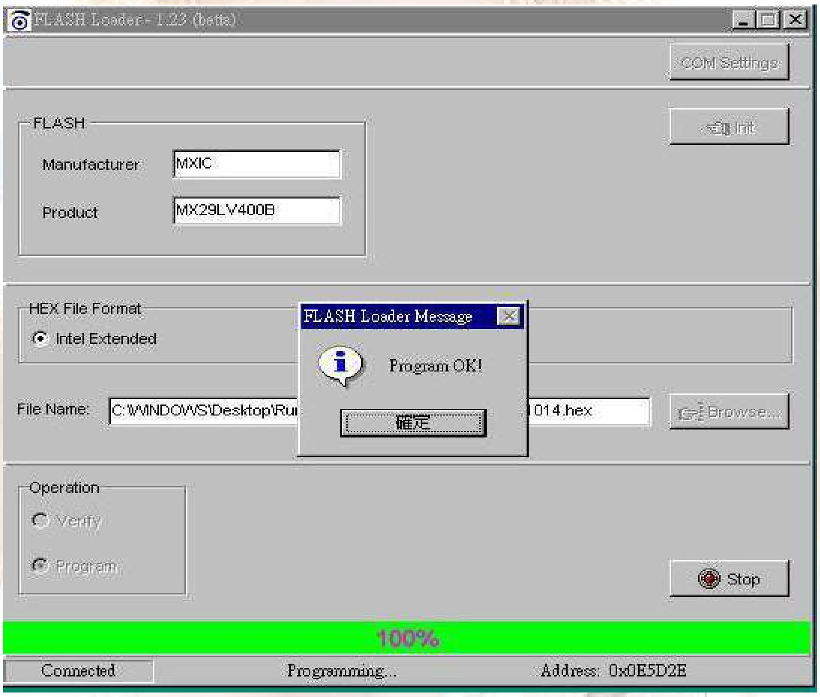
Step 6

Start download firmware



Step 7

Download finished.



Step 8

Turn off the power switch.

15. RS232 Codes

Event Packet Type command:

Command	Packet Header (7 bytes)	Packet Payload (6 bytes)
Power	BE EF 02 06 00 97 CF	AE 00 00 00 00 00
Auto	BE EF 02 06 00 AB CA	92 00 00 00 00 00
Source	BE EF 02 06 00 98 CA	9B 00 00 00 00 00
Menu	BE EF 02 06 00 7A CB	93 00 00 00 00 00
Left (-)	BE EF 02 06 00 2F CB	96 00 00 00 00 00
Right (+)	BE EF 02 06 00 CD CA	94 00 00 00 00 00
UP	BE EF 02 06 00 FE CA	97 00 00 00 00 00
Down	BE EF 02 06 00 1C CB	95 00 00 00 00 00
Blank	BE EF 02 06 00 AD CD	B4 00 00 00 00 00
Still	BE EF 02 06 00 1A CC	B3 00 00 00 00 00
Resize	BE EF 02 06 00 85 CB	9C 00 00 00 00 00
Keystone (+)	BE EF 02 06 00 D5 C7	CC 00 00 00 00 00
Keystone (-)	BE EF 02 06 00 04 C6	CD 00 00 00 00 00
Zoom (+)	BE EF 02 06 00 7C CC	B5 00 00 00 00 00
Zoom (-)	BE EF 02 06 00 4F CC	B6 00 00 00 00 00
Enter	BE EF 02 06 00 B3 C7	CA 00 00 00 00 00

Operation Packet Type command
PC Picture Controls

Command	Packet Header (7 bytes)	Packet Payload (25 bytes)
Brightness +	BE EF 03 19 00 EE 68	03 CA 02 CC CC 00 00 00 00 CC×16
Brightness -	BE EF 03 19 00 80 C2	04 CA 02 CC CC 00 00 00 00 CC×16
Contrast +	BE EF 03 19 00 34 D9	07 C9 02 CC CC 00 00 00 00 CC×16
Contrast -	BE EF 03 19 00 11 8C	03 C9 02 CC CC 00 00 00 00 CC×16

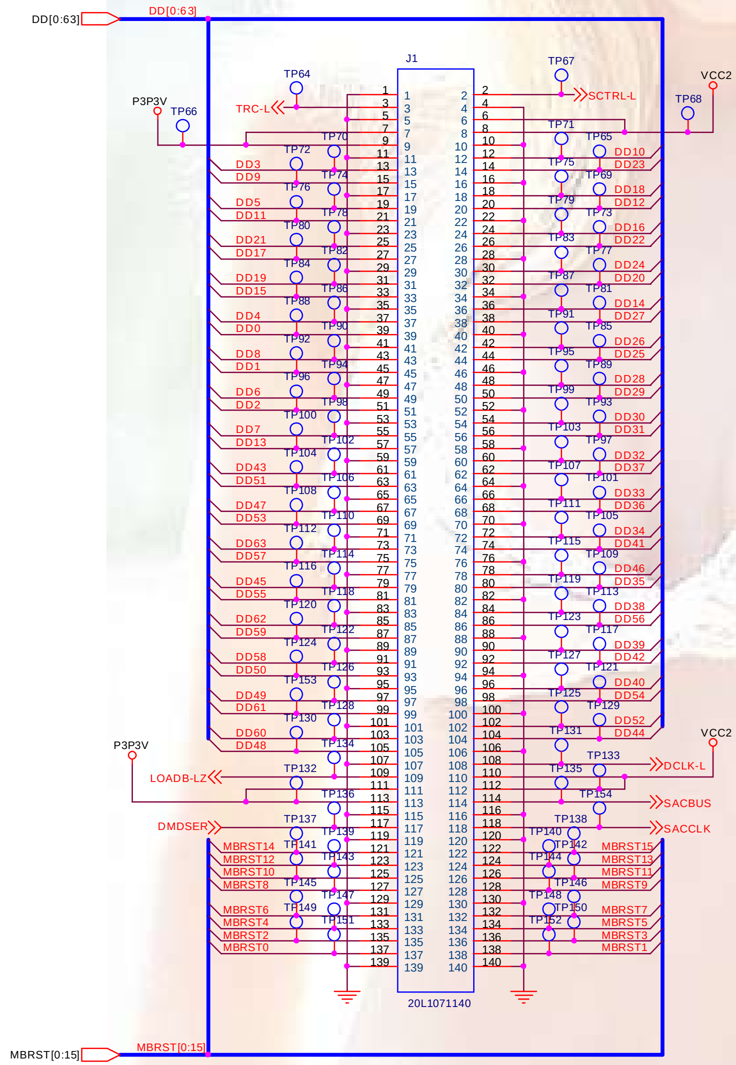
YPbPr Picture Controls

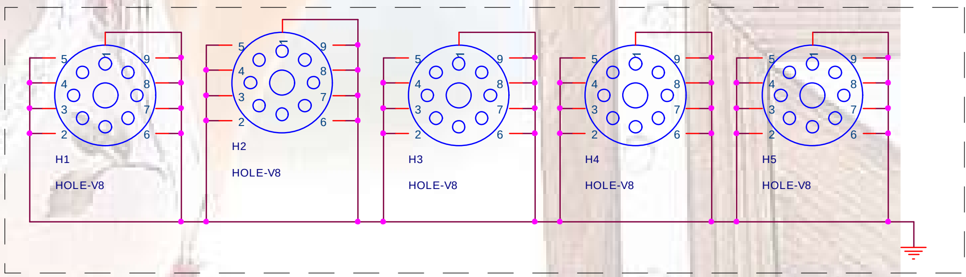
Command	Packet Header (7 bytes)	Packet Payload (25 bytes)
Brightness +	BE EF 03 19 00 44 81	03 D5 02 CC CC FF FF FF FF CC×16
Brightness -	BE EF 03 19 00 2A 2B	04 D5 02 CC CC FF FF FF FF CC×16
Contrast +	BE EF 03 19 00 BB 65	03 D6 02 CC CC FF FF FF FF CC×16
Contrast -	BE EF 03 19 00 D5 CF	04 D6 02 CC CC FF FF FF FF CC×16

S-Video / Composite Video Picture Controls

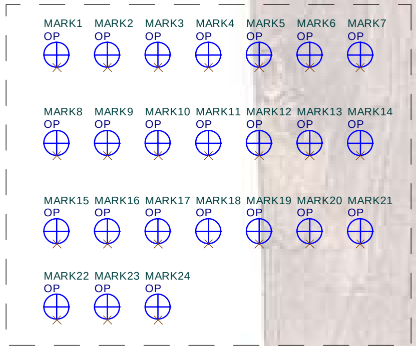
Command	Packet Header (7 bytes)	Packet Payload (25 bytes)
Brightness +	BE EF 03 19 00 95 52	03 4B 02 CC CC 00 00 00 00 CC x16
Brightness -	BE EF 03 19 00 FB F8	04 4B 02 CC CC 00 00 00 00 CC x16
Contrast +	BE EF 03 19 00 BF C4	03 4C 02 CC CC 00 00 00 00 CC x16
Contrast -	BE EF 03 19 00 D1 6E	04 4C 02 CC CC 00 00 00 00 CC x16
Color +	BE EF 03 19 00 C0 EE	03 54 02 CC CC 00 00 00 00 CC X16
Color -	BE EF 03 19 00 AE 44	04 54 02 CC CC 00 00 00 00 CC x16
Tint +	BE EF 03 19 00 EA 78	03 53 02 CC CC 00 00 00 00 CC x16
Tint -	BE EF 03 19 00 84 D2	04 53 02 CC CC 00 00 00 00 CC x16

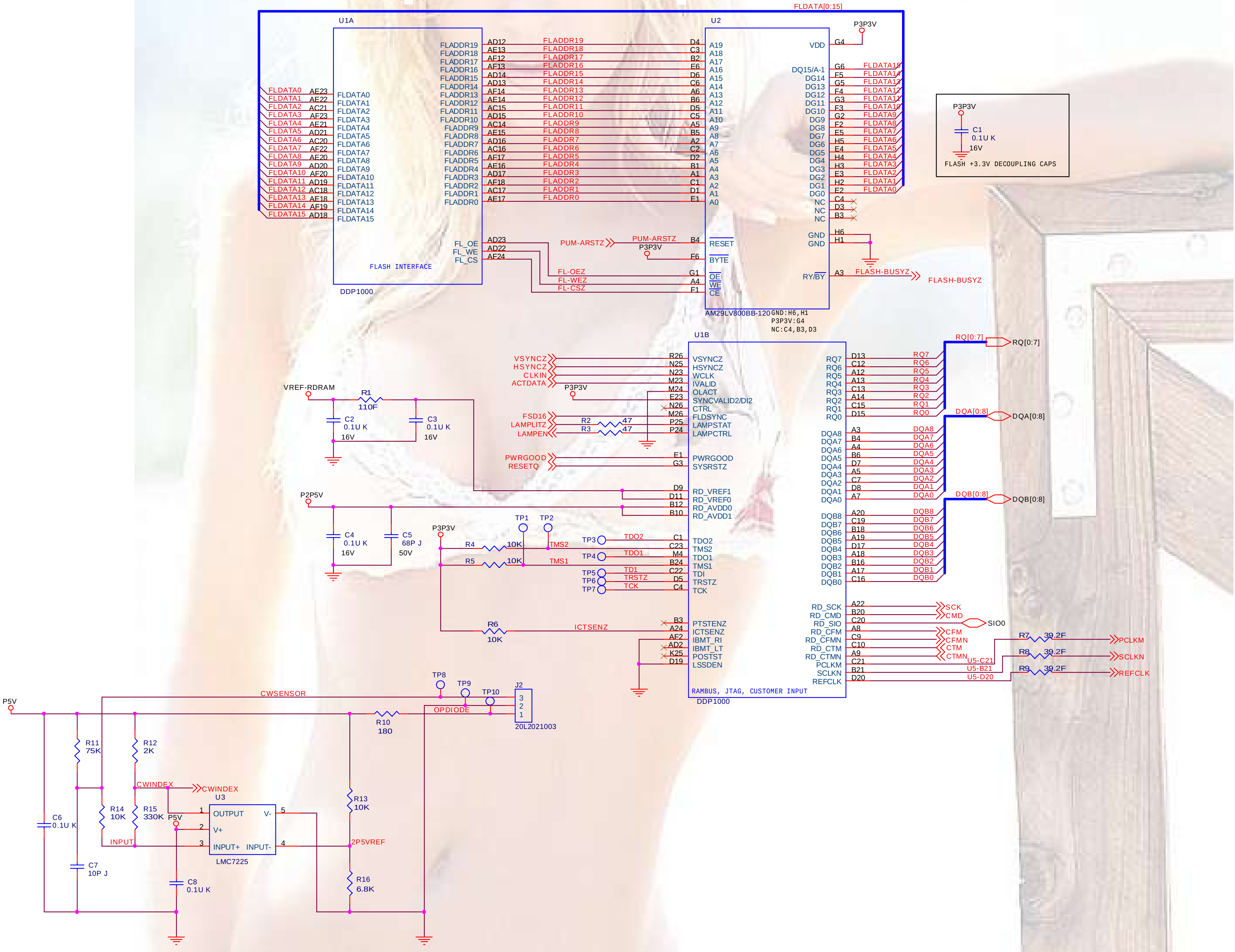
DMD DRIVER

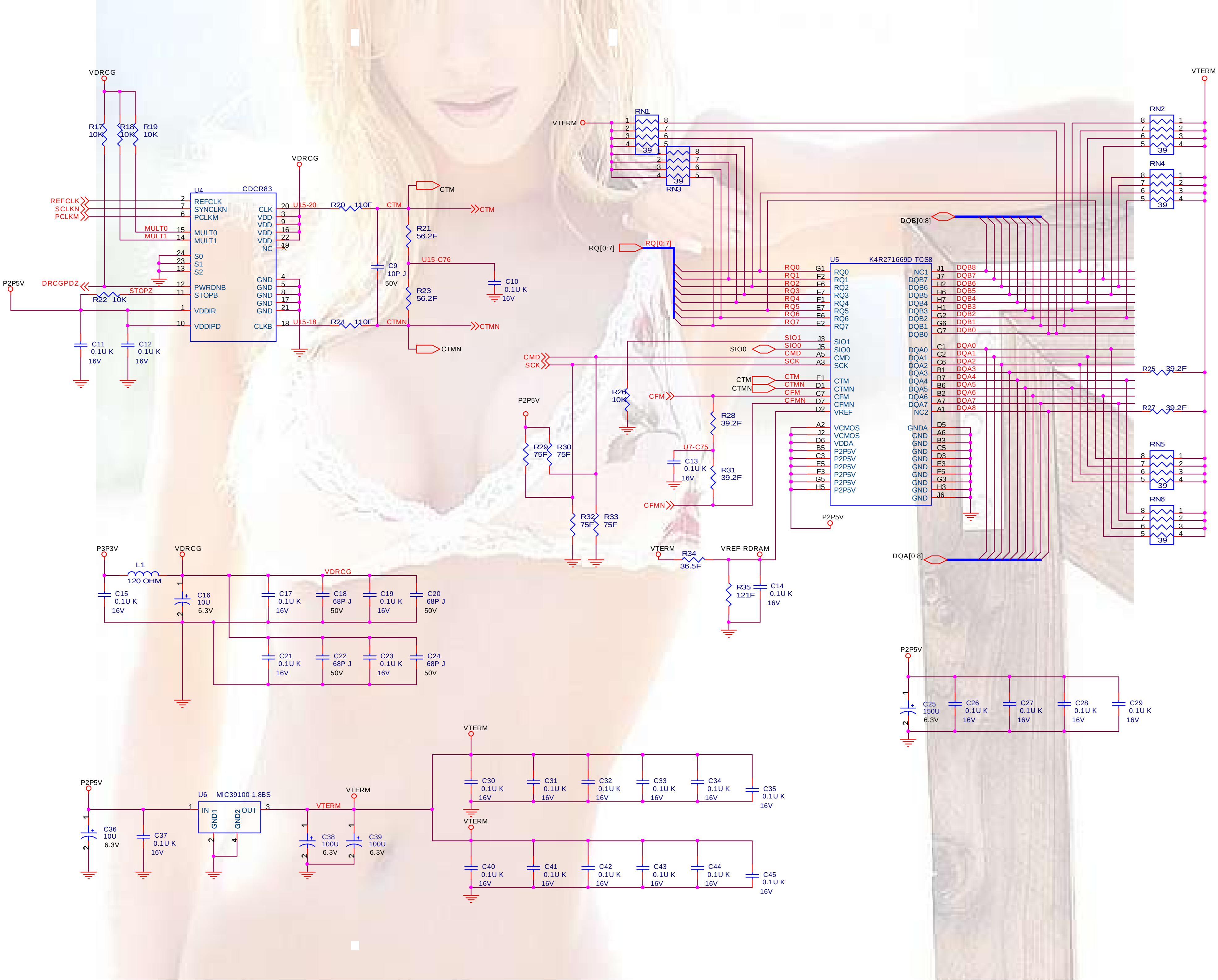




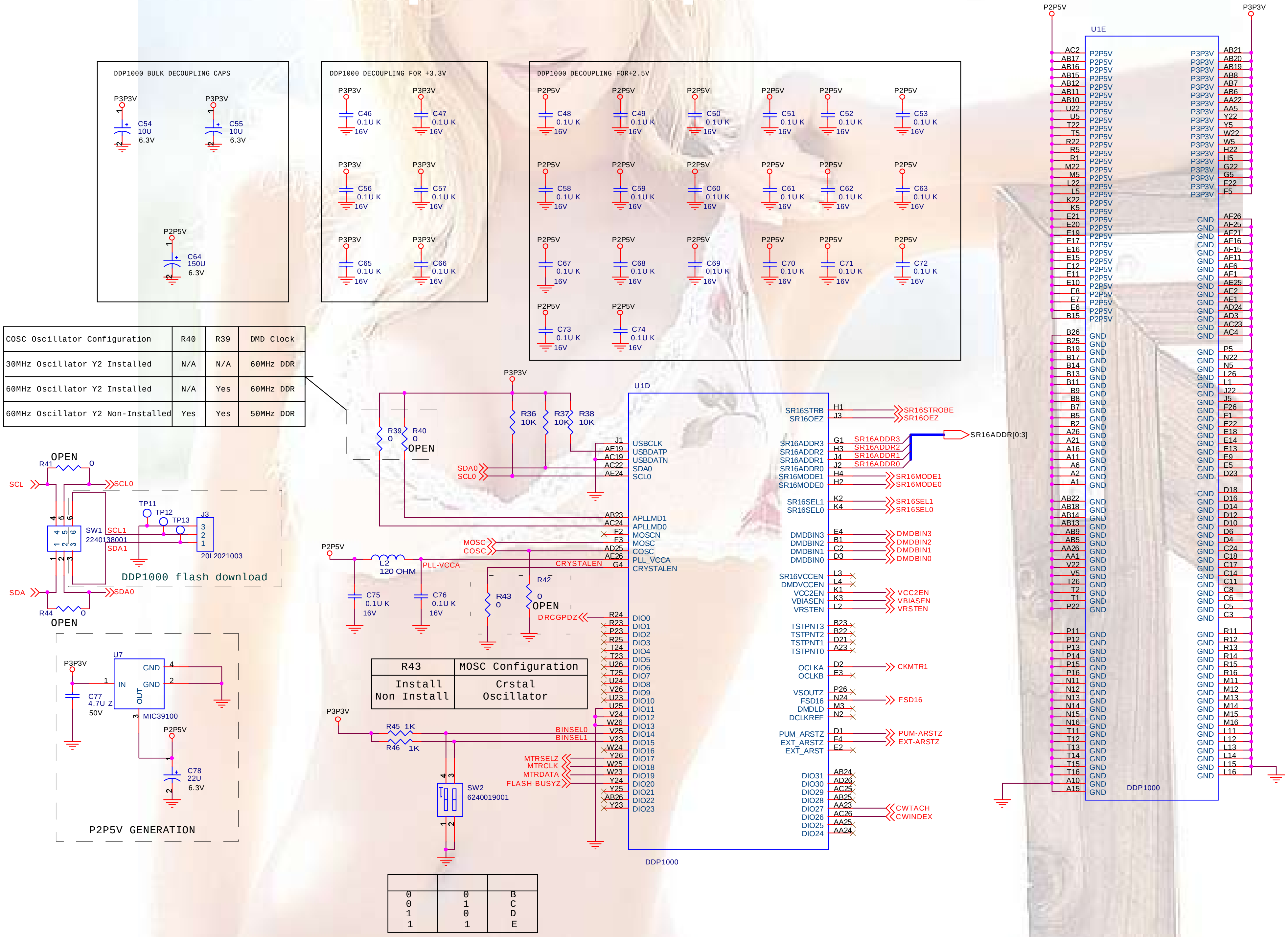
Optical Points




FLDATA[0:15]
U1A
U2
P3P3V
FLADDR19 FLADDR18 FLADDR17 FLADDR16 FLADDR15 FLADDR14 FLADDR13 FLADDR12 FLADDR11 FLADDR10 FLADDR9 FLADDR8 FLADDR7 FLADDR6 FLADDR5 FLADDR4 FLADDR3 FLADDR2 FLADDR1 FLADDR0
FLDATA0 FLDATA1 FLDATA2 FLDATA3 FLDATA4 FLDATA5 FLDATA6 FLDATA7 FLDATA8 FLDATA9 FLDATA10 FLDATA11 FLDATA12 FLDATA13 FLDATA14 FLDATA15
A19 A18 A17 A16 A15 A14 A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
VDD
DQ15/A-1 DG14 DG13 DG12 DG11 DG10 DG9 DG8 DG7 DG6 DG5 DG4 DG3 DG2 DG1 DG0
NC NC NC
GND GND
RESET
BYTE
OE WE CE
RY/BY
FL_OE FL_WE FL_CS
FLASH INTERFACE
DDP1000
PUM-ARSTZ
FL-OEZ FL-WEZ FL-CSZ
FLASH-BUSYZ
AM29LV800BB-120
GND:H6,H1
P3P3V:G4
NC:C4,B3,D3
P3P3V
C1
0.1U K
16V
FLASH +3.3V DECOUPLING CAPS
U1B
VSYNCZ HSYNCZ CLKIN ACTDATA
VSYNCZ HSYNCZ WCLK IVALID OLACT SYNCVALID2/DI2 CTRL FLDSYNC LAMPSTAT LAMPCTRL
FSD16 LAMPLITZ LAMPEN
R2 47
R3 47
PWRGOOD RESETQ
PWRGOOD SYSRSTZ
VREF-RDRAM
R1 110F
C2 0.1U K 16V
C3 0.1U K 16V
RD_VREF1 RD_VREF0 RD_AVDD0 RD_AVDD1
P2P5V
C4 0.1U K 16V
C5 68P J 50V
TP1 TP2
TP3 TP4 TP5 TP6 TP7
R4 10K
R5 10K
TMS2 TMS1
TDO2 TDO1 TD1 TRSTZ TCK
TDO2 TMS2 TDO1 TMS1 TDI TRSTZ TCK
R6 10K
ICTSENZ
PTSTENZ ICTSENZ IBMT_RI IBMT_LT POSTST LSSDEN
RAMBUS, JTAG, CUSTOMER INPUT
DDP1000
RQ[0:7]
RQ7 RQ6 RQ5 RQ4 RQ3 RQ2 RQ1 RQ0
DQA[0:8]
DQA8 DQA7 DQA6 DQA5 DQA4 DQA3 DQA2 DQA1 DQA0
DQB[0:8]
DQB8 DQB7 DQB6 DQB5 DQB4 DQB3 DQB2 DQB1 DQB0
RD_SCK RD_CMD RD_SIO RD_CFM RD_CFMN RD_CTM RD_CTMN PCLKM SCLKN REFCLK
SCK CMD SIO0 CFM CFMN CTM CTMN
U5-C21 U5-B21 U5-D20
R7 39.2F
R8 39.2F
R9 39.2F
PCLKM SCLKN REFCLK
P5V
CWSENSOR
TP8 TP9 TP10
J2
3 2 1
20L2021003
OPDIODE
R10 180
R11 75K
R12 2K
CWINDEX
U3
OUTPUT V-
V+
INPUT+ INPUT-
LMC7225
R14 10K
R15 330K
P5V
INPUT
C6 0.1U K
C7 10P J
C8 0.1U K
R13 10K
2P5VREF
R16 6.8K



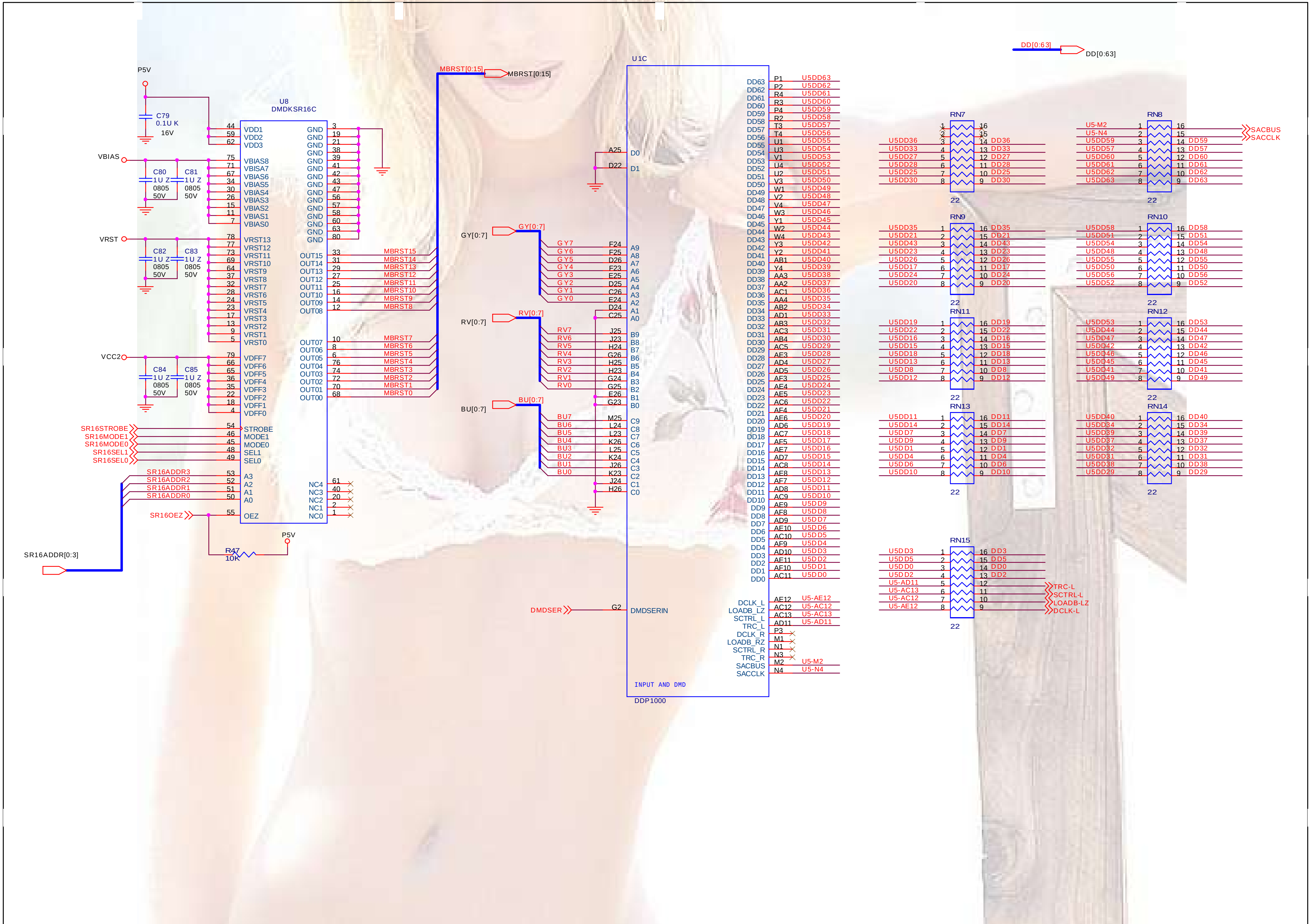
VDRCG
R17 10K
R18 10K
R19 10K
REFCLK
SCLKN
PCLKM
MULT0
MULT1
U4 CDCR83
REFCLK
SYNCLKN
PCLKM
MULT0
MULT1
S0
S1
S2
PWRDNB
STOPB
VDDIR
VDDIPD
CLK
VDD
NC
GND
CLKB
P2P5V
DRCGPDZ
STOPZ
R22 10K
C11 0.1U K 16V
C12 0.1U K 16V
U15-20
R20 110F
CTM
CTMN
U15-18
R24 110F
R21 56.2F
R23 56.2F
C9 10P J 50V
U15-C76
C10 0.1U K 16V
VTERM
RN1
RN2
RN3
RN4
RN5
RN6
39
RQ[0:7]
DQB[0:8]
DQA[0:8]
U5 K4R271669D-TCS8
RQ0
RQ1
RQ2
RQ3
RQ4
RQ5
RQ6
RQ7
SIO1
SIO0
CMD
SCK
CTM
CTMN
CFM
CFMN
VREF
VCMOS
VDDA
P2P5V
NC1
NC2
DQB8
DQB7
DQB6
DQB5
DQB4
DQB3
DQB2
DQB1
DQB0
DQA0
DQA1
DQA2
DQA3
DQA4
DQA5
DQA6
DQA7
DQA8
GNDA
GND
R25 39.2F
R27 39.2F
R26 10K
R28 39.2F
R31 39.2F
U7-C75
C13 0.1U K 16V
R29 75F
R30 75F
R32 75F
R33 75F
R34 36.5F
R35 121F
C14 0.1U K 16V
VREF-RDRAM
P3P3V
L1 120 OHM
C15 0.1U K 16V
C16 10U 6.3V
C17 0.1U K 16V
C18 68P J 50V
C19 0.1U K 16V
C20 68P J 50V
C21 0.1U K 16V
C22 68P J 50V
C23 0.1U K 16V
C24 68P J 50V
C25 150U 6.3V
C26 0.1U K 16V
C27 0.1U K 16V
C28 0.1U K 16V
C29 0.1U K 16V
U6 MIC39100-1.8BS
IN
OUT
GND1
GND2
C36 10U 6.3V
C37 0.1U K 16V
C38 100U 6.3V
C39 100U 6.3V
C30 0.1U K 16V
C31 0.1U K 16V
C32 0.1U K 16V
C33 0.1U K 16V
C34 0.1U K 16V
C35 0.1U K 16V
C40 0.1U K 16V
C41 0.1U K 16V
C42 0.1U K 16V
C43 0.1U K 16V
C44 0.1U K 16V
C45 0.1U K 16V



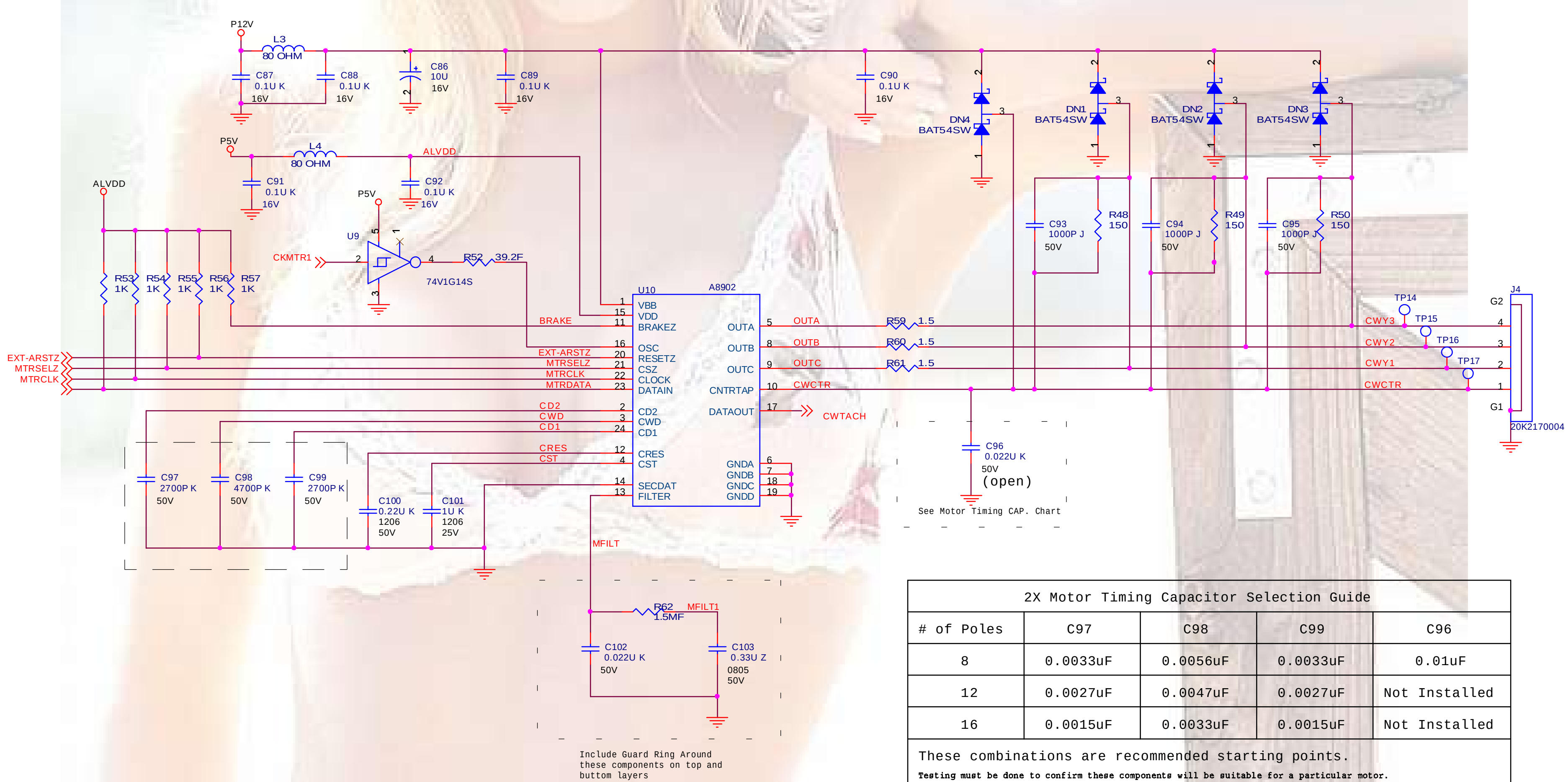
COSC Oscillator Configuration	R40	R39	DMD Clock
30MHz Oscillator Y2 Installed	N/A	N/A	60MHz DDR
60MHz Oscillator Y2 Installed	N/A	Yes	60MHz DDR
60MHz Oscillator Y2 Non-Installed	Yes	Yes	50MHz DDR

R43	MOSC Configuration
Install	Crstal Oscillator
Non Install	Oscillator

0	0	B
0	1	C
1	0	D
1	1	E



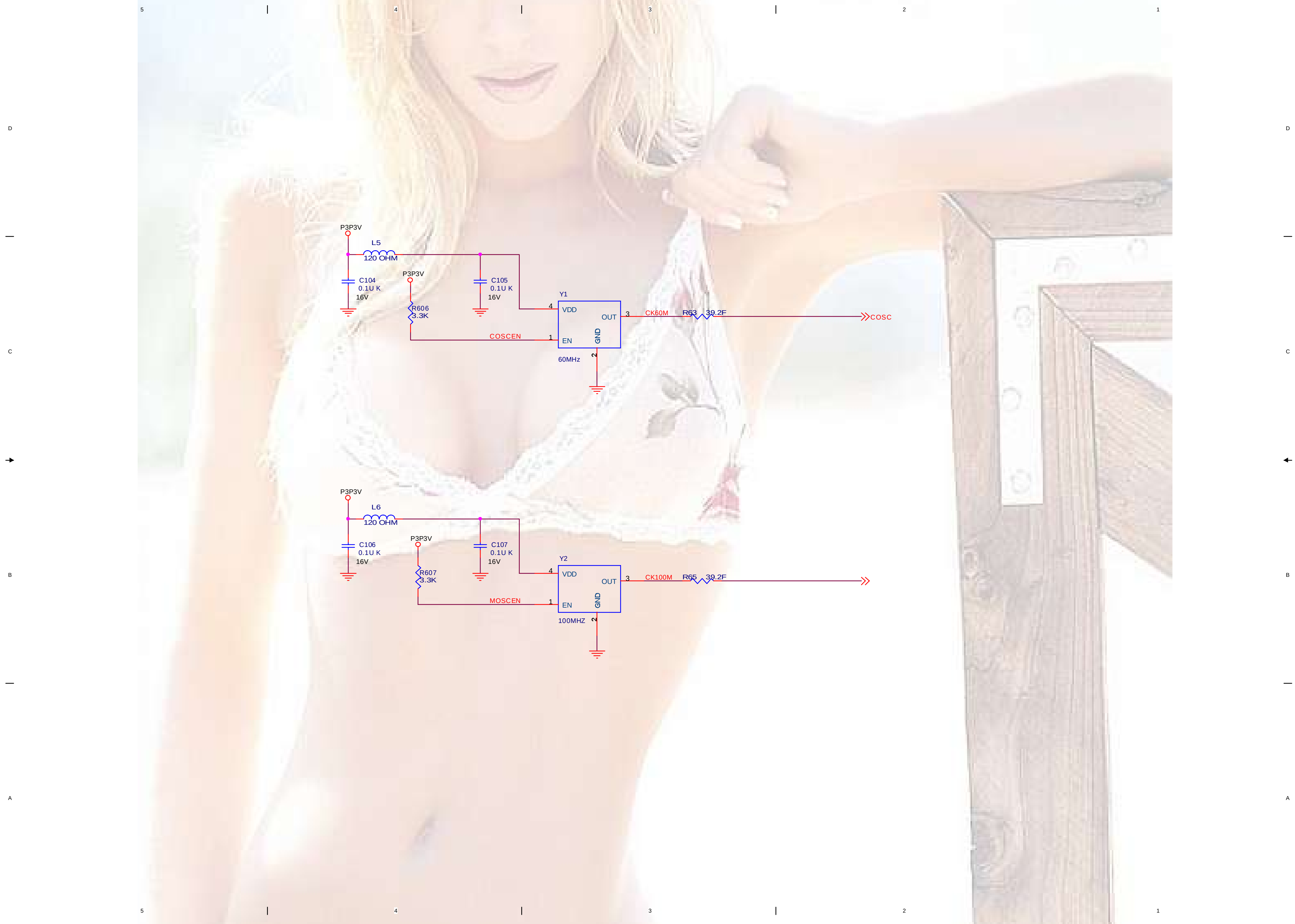
P5V
C79
0.1U K
16V
U8
DMDKSR16C
VBIAS
VRST
VCC2
C80
C81
C82
C83
C84
C85
1U Z
0805
50V
VDD1
VDD2
VDD3
VBIAS8
VBIAS0
VRST13
VRST0
VDFF7
VDFF0
STROBE
MODE1
MODE0
SEL1
SEL0
A3
A2
A1
A0
OEZ
GND
OUT15
OUT00
NC4
NC3
NC2
NC1
NC0
SR16STROBE
SR16MODE1
SR16MODE0
SR16SEL1
SR16SEL0
SR16ADDR3
SR16ADDR2
SR16ADDR1
SR16ADDR0
SR16OEZ
SR16ADDR[0:3]
R47
10K
MBRST[0:15]
MBRST15
MBRST0
GY[0:7]
RV[0:7]
BU[0:7]
DMDSER
DMDSERIN
U1C
DDP1000
INPUT AND DMD
D0
D1
DD63
DD0
DCLK_L
LOADB_LZ
SCTRL_L
TRC_L
DCLK_R
LOADB_RZ
SCTRL_R
TRC_R
SACBUS
SACCLK
U5-M2
U5-N4
U5-AE12
U5-AC12
U5-AC13
U5-AD11
DD[0:63]
RN7
RN8
RN9
RN10
RN11
RN12
RN13
RN14
RN15
22
TRC-L
SCTRL-L
LOADB-LZ
DCLK-L



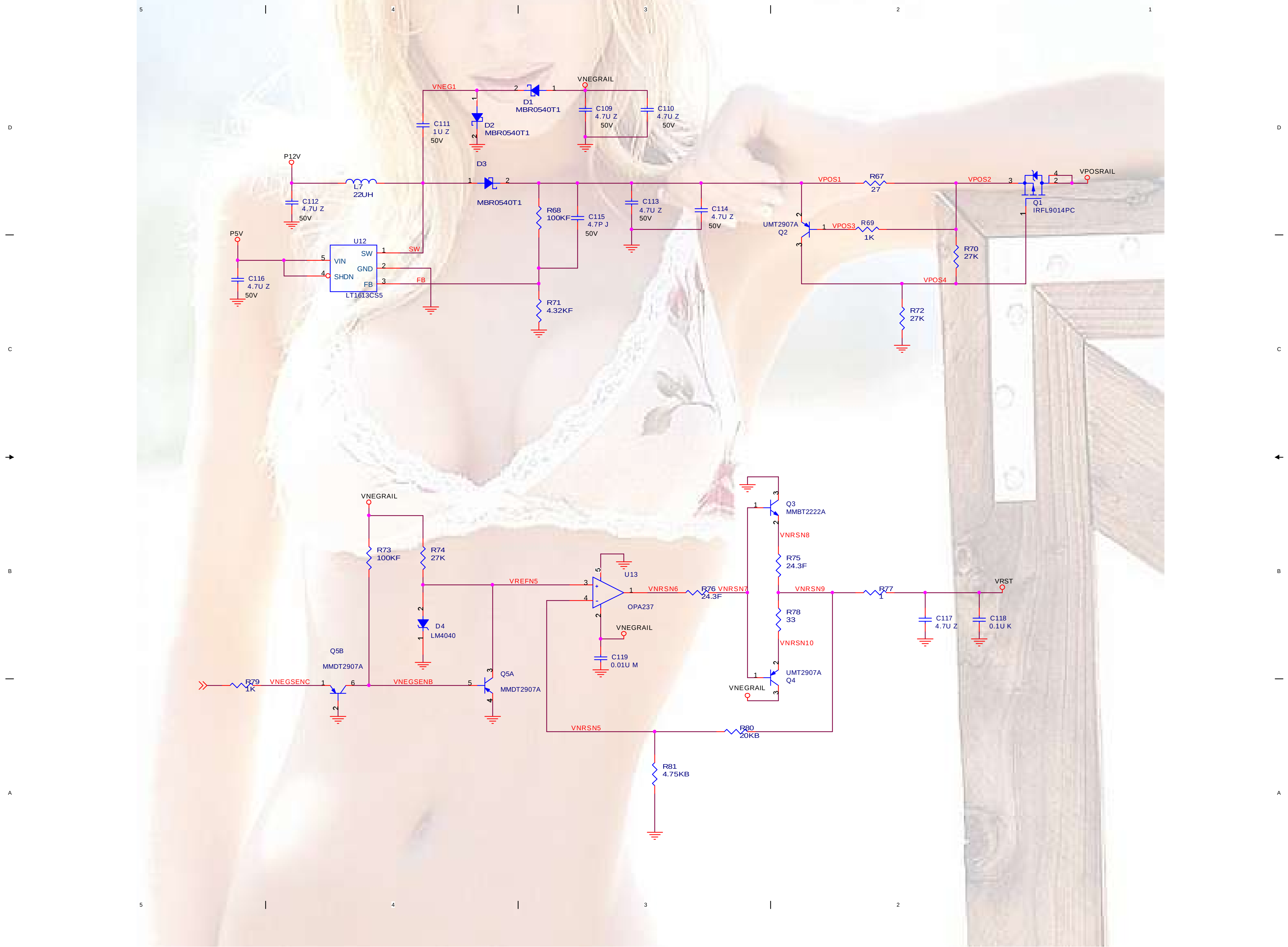
2X Motor Timing Capacitor Selection Guide				
# of Poles	C97	C98	C99	C96
8	0.0033uF	0.0056uF	0.0033uF	0.01uF
12	0.0027uF	0.0047uF	0.0027uF	Not Installed
16	0.0015uF	0.0033uF	0.0015uF	Not Installed

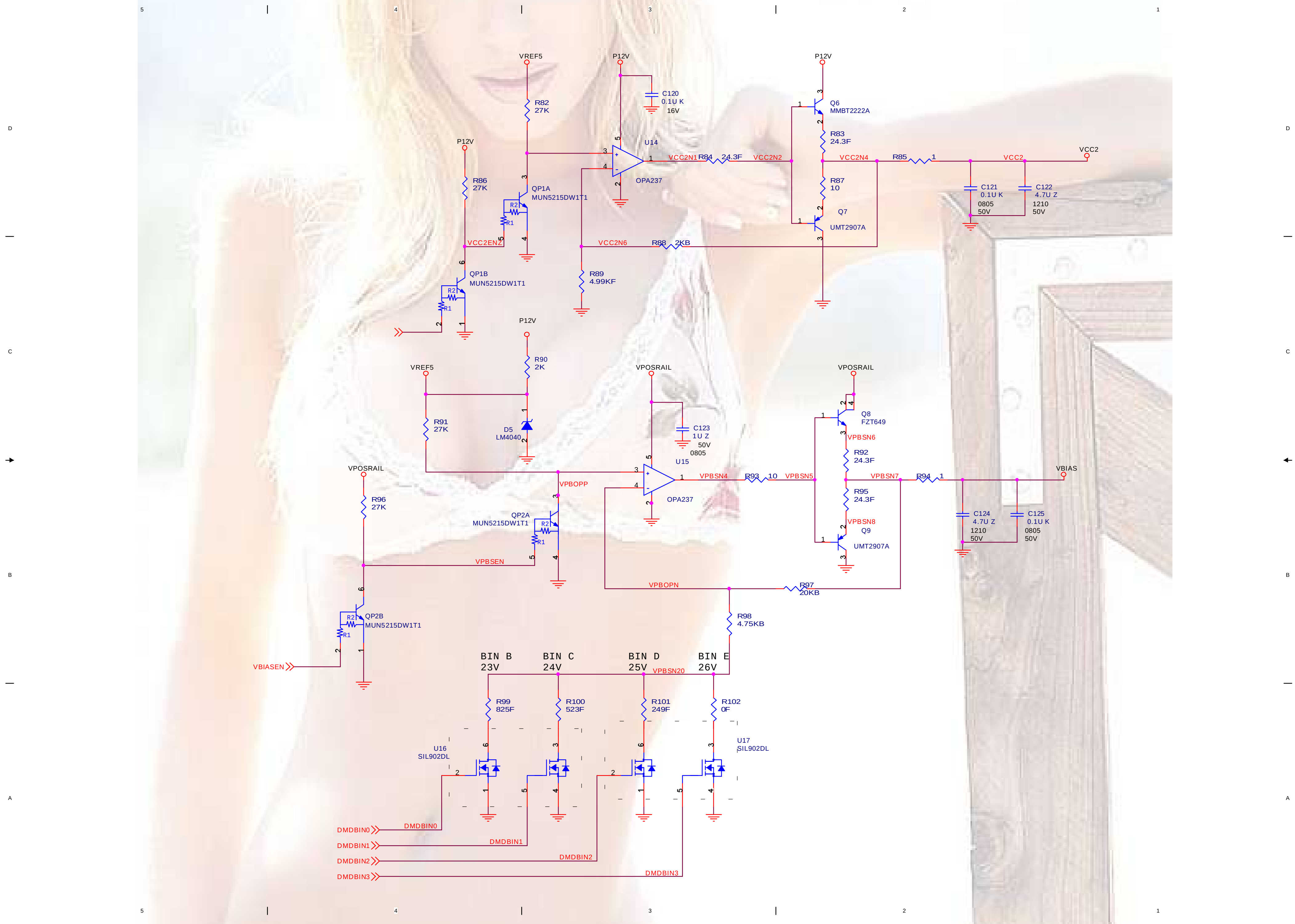
These combinations are recommended starting points.

Testing must be done to confirm these components will be suitable for a particular motor.

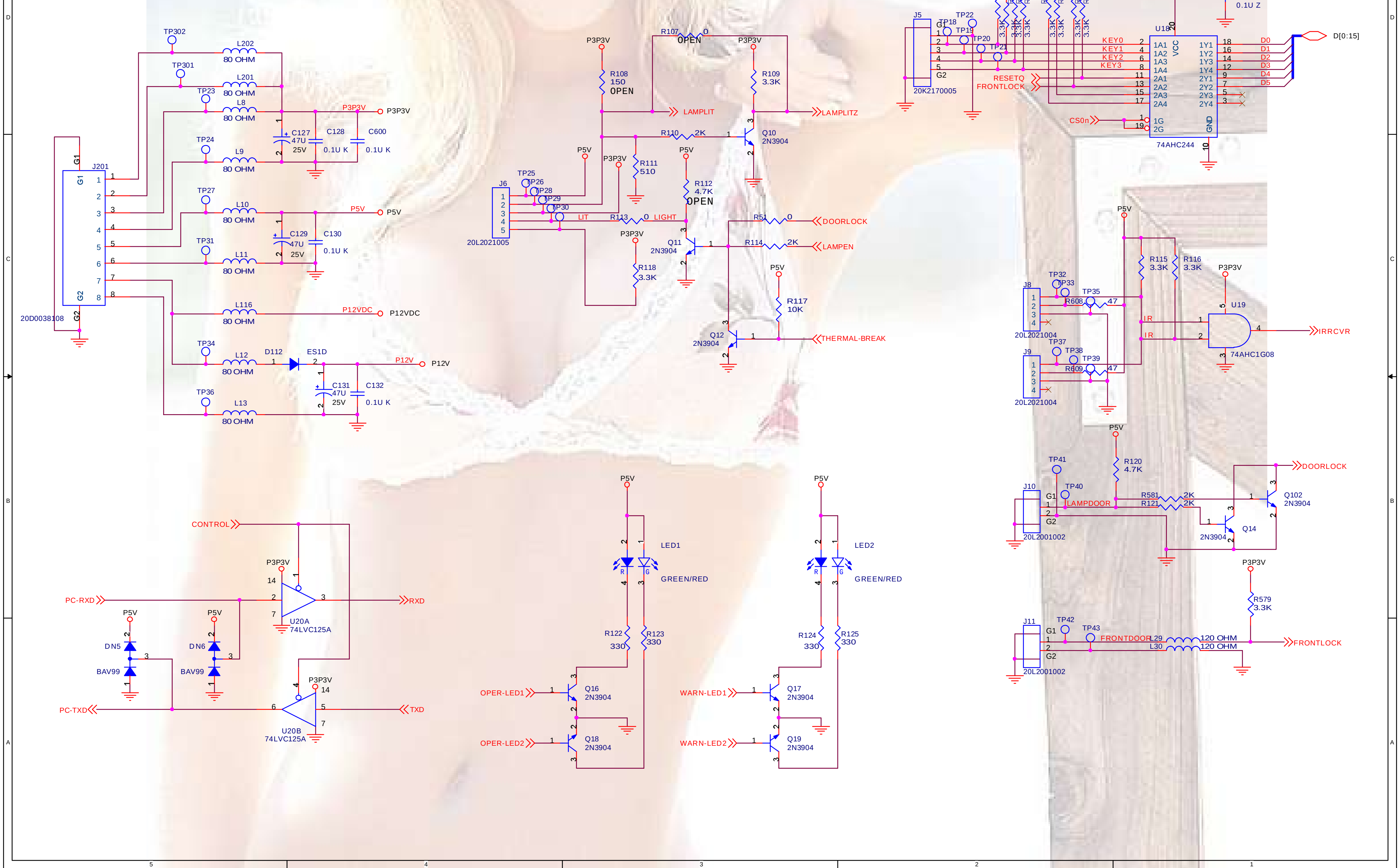


P3P3V
L5
120 OHM
C104
0.1U K
16V
P3P3V
R606
3.3K
C105
0.1U K
16V
Y1
VDD
OUT
EN
GND
60MHz
COSCEN
CK60M
R63
39.2F
COSC
P3P3V
L6
120 OHM
C106
0.1U K
16V
P3P3V
R607
3.3K
C107
0.1U K
16V
Y2
VDD
OUT
EN
GND
100MHZ
MOSCEN
CK100M
R65
39.2F

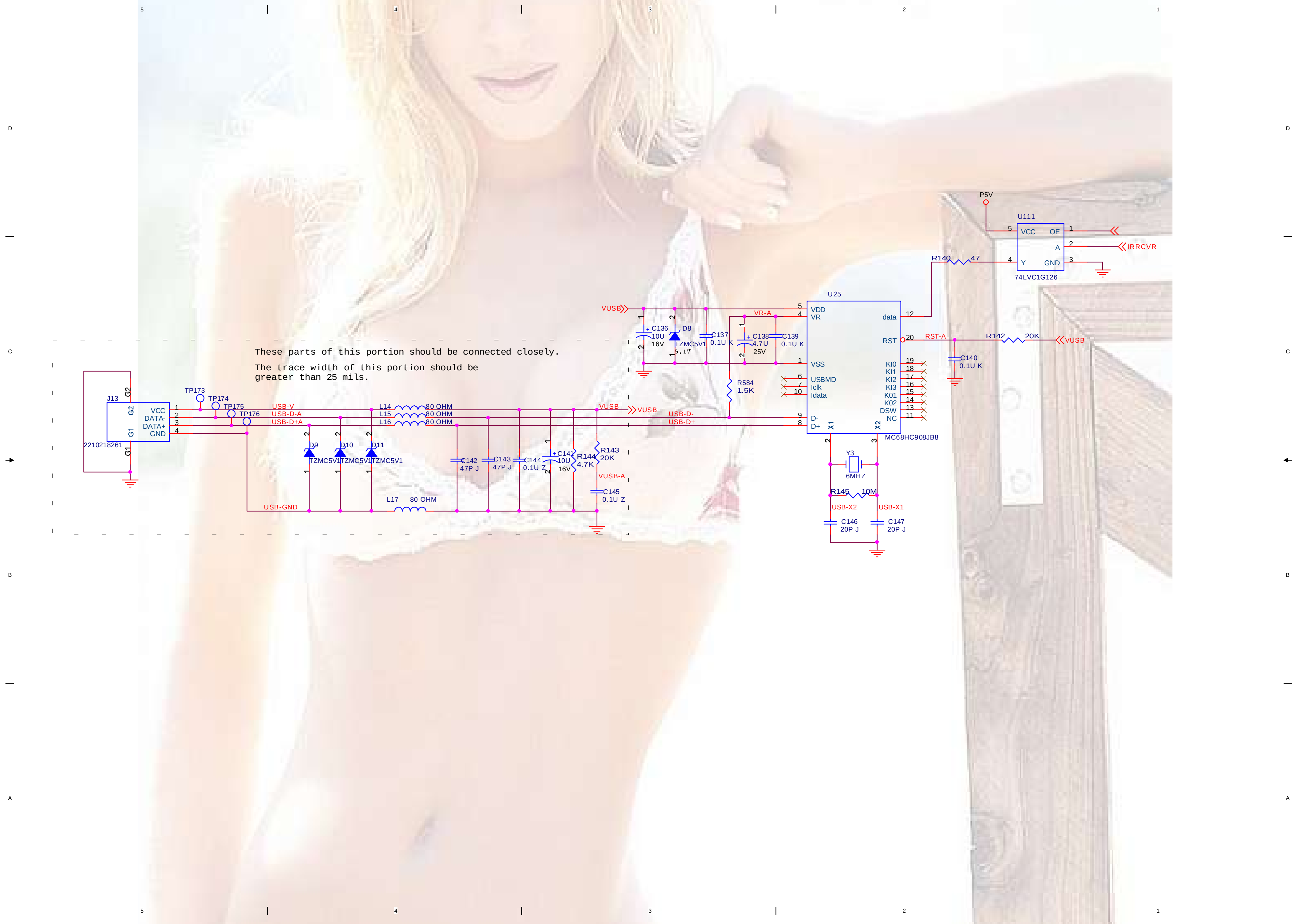

5
4
3
2
1
D
C
B
A
VNEG1
D1
MBR0540T1
VNEGRAIL
C109
4.7U Z
50V
C110
4.7U Z
50V
C111
1U Z
50V
D2
MBR0540T1
P12V
L7
22UH
D3
MBR0540T1
C112
4.7U Z
50V
R68
100KF
C115
4.7P J
50V
C113
4.7U Z
50V
C114
4.7U Z
50V
VPOS1
R67
27
VPOS2
Q1
IRFL9014PC
VPOSRAIL
UMT2907A
Q2
VPOS3
R69
1K
R70
27K
VPOS4
R72
27K
P5V
U12
VIN
SHDN
SW
GND
FB
LT1613CS5
SW
FB
C116
4.7U Z
50V
R71
4.32KF
VNEGRAIL
R73
100KF
R74
27K
VREFN5
U13
OPA237
VNRSN6
R76
24.3F
VNRSN7
D4
LM4040
VNEGRAIL
C119
0.01U M
Q3
MMBT2222A
VNRSN8
R75
24.3F
VNRSN9
R77
1
VRST
C117
4.7U Z
C118
0.1U K
R78
33
VNRSN10
UMT2907A
Q4
VNEGRAIL
Q5B
MMDT2907A
R79
1K
VNEGSENC
VNEGSENB
Q5A
MMDT2907A
VNRSN5
R80
20KB
R81
4.75KB

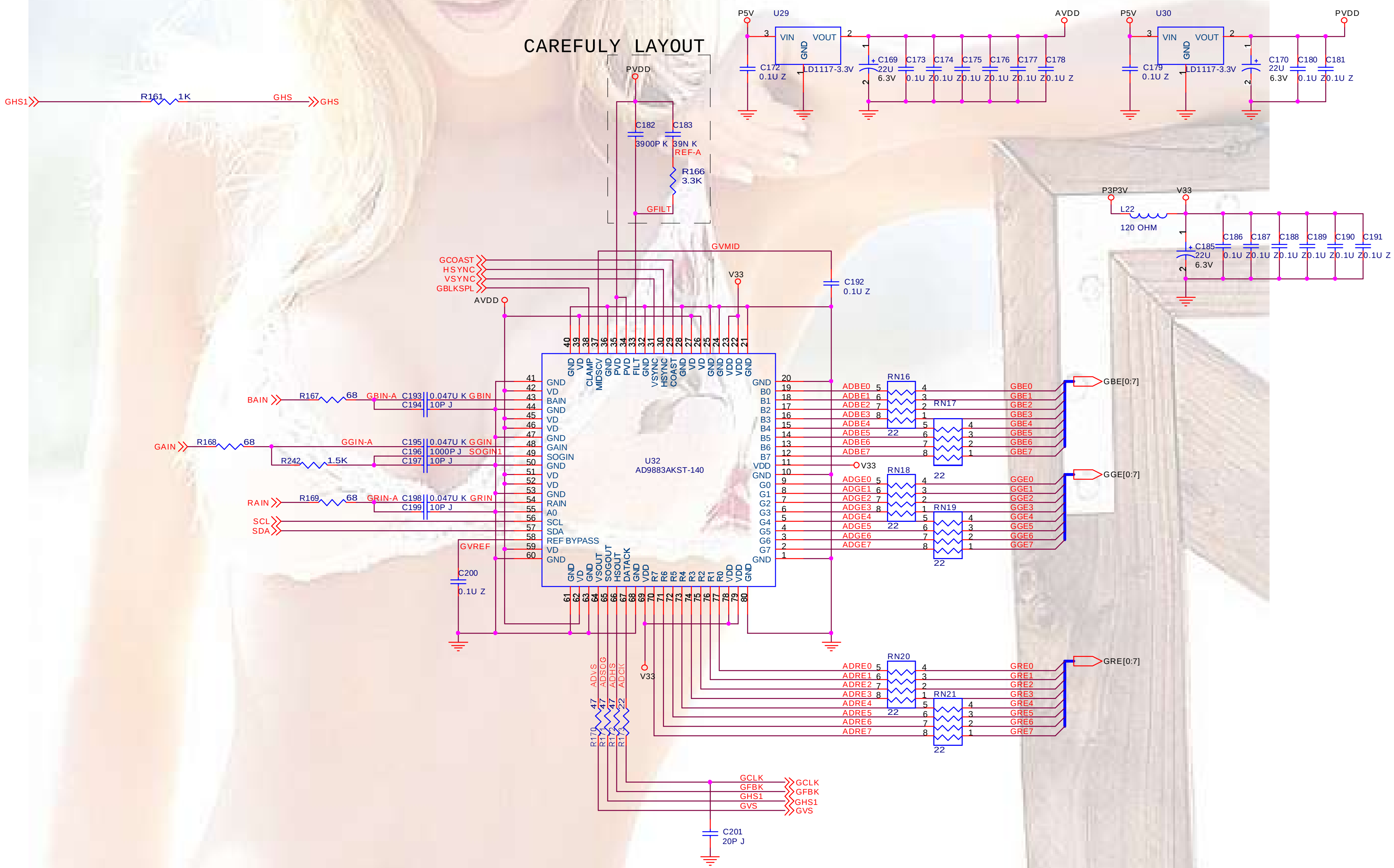

VREF5
P12V
C120
0.1U K
16V
R82
27K
U14
OPA237
VCC2N1
R84
24.3F
VCC2N2
Q6
MMBT2222A
R83
24.3F
VCC2N4
R85
1
VCC2
C121
0.1U K
0805
50V
C122
4.7U Z
1210
50V
R87
10
Q7
UMT2907A
R86
27K
QP1A
MUN5215DW1T1
VCC2EN2
VCC2N6
R88
2KB
R89
4.99KF
QP1B
MUN5215DW1T1
R90
2K
D5
LM4040
R91
27K
VPOSRAIL
C123
1U Z
50V
0805
U15
OPA237
VPBSN4
R93
10
VPBSN5
Q8
FZT649
VPBSN6
R92
24.3F
VPBSN7
R94
1
VBIAS
R95
24.3F
VPBSN8
Q9
UMT2907A
C124
4.7U Z
1210
50V
C125
0.1U K
0805
50V
VPBOPP
R96
27K
QP2A
MUN5215DW1T1
VPBSEN
VPBOPN
R97
20KB
R98
4.75KB
QP2B
MUN5215DW1T1
VBIASEN
BIN B
23V
BIN C
24V
BIN D
25V
BIN E
26V
VPBSN20
R99
825F
R100
523F
R101
249F
R102
0F
U16
SIL902DL
U17
SIL902DL
DMDBIN0
DMDBIN1
DMDBIN2
DMDBIN3

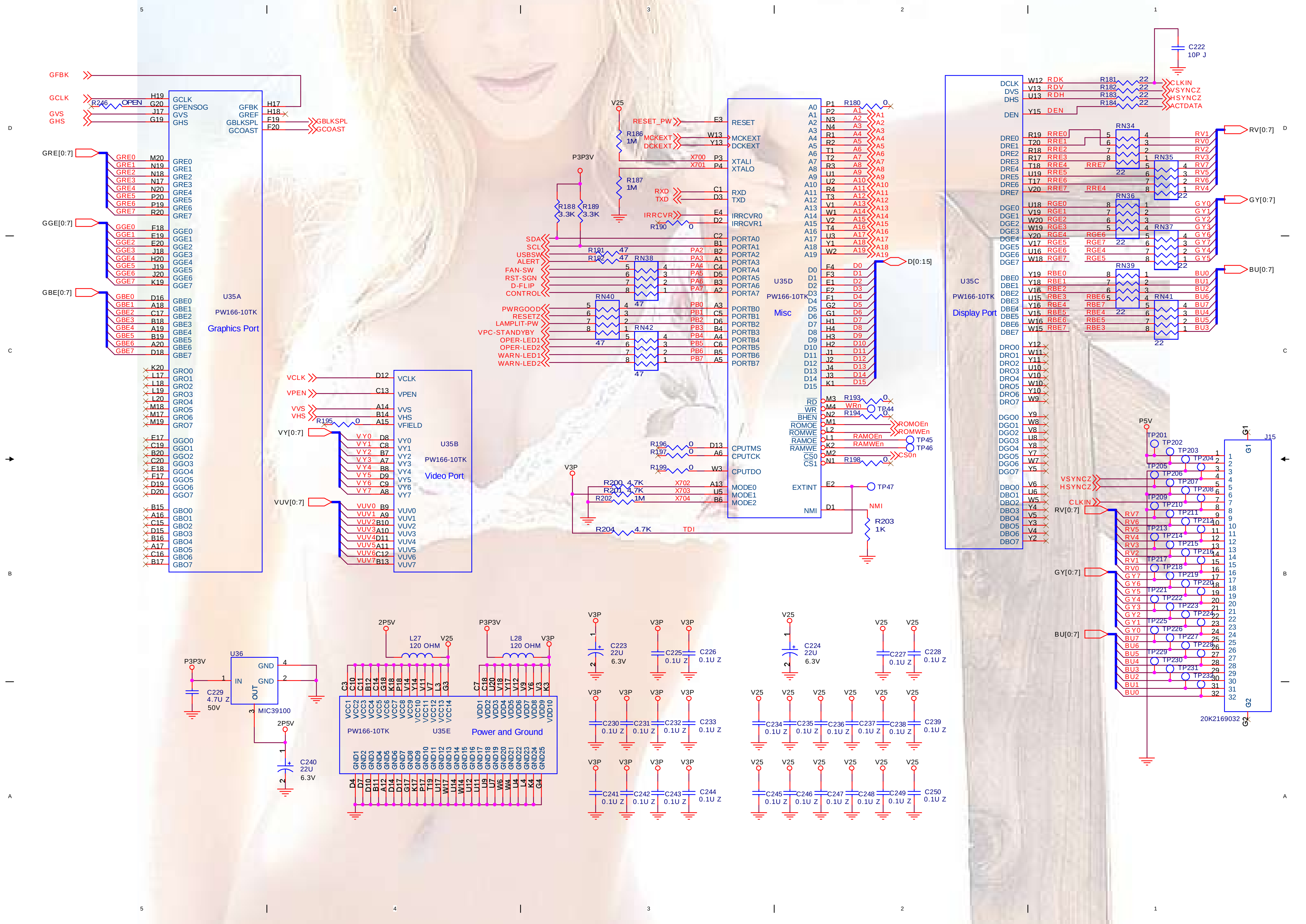
MAIN BOARD



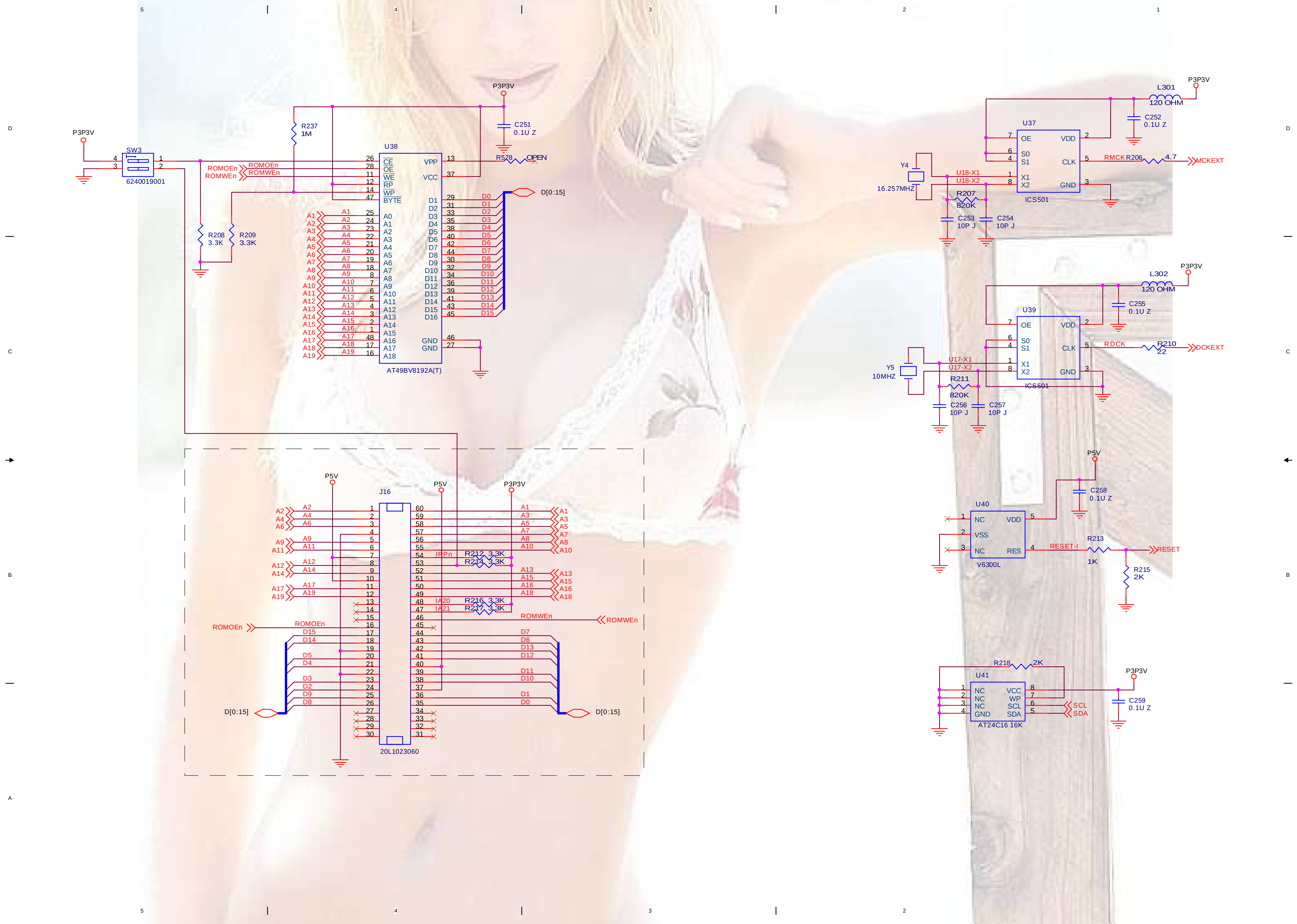
J201
20D0038108
TP302
TP301
TP23
TP24
TP27
TP31
TP34
TP36
L202
L201
L8
L9
L10
L11
L116
L12
L13
80 OHM
C127
47U
25V
C128
0.1U K
C600
C129
C130
C131
C132
P3P3V
P5V
P12VDC
P12V
D112
ES1D
J6
20L2021005
TP25
TP26
TP28
TP29
TP30
R107
OPEN
R108
150
R109
3.3K
LAMPLIT
LAMPLITZ
R110
2K
Q10
2N3904
R111
510
R112
4.7K
R113
LIT
LIGHT
R51
DOORLOCK
Q11
R114
LAMPEN
R118
R117
10K
Q12
THERMAL-BREAK
J5
20K2170005
TP18
TP19
TP20
TP21
TP22
R103
R104
R105
R106
R573
R574
R575
R576
KEY0
KEY1
KEY2
KEY3
RESETQ
FRONTLOCK
CS0n
U18
74AHC244
C126
0.1U Z
D[0:15]
D0
D1
D2
D3
D4
D5
J8
J9
20L2021004
TP32
TP33
TP35
TP37
TP38
TP39
R608
R609
47
R115
R116
IR
U19
74AHC1G08
IRRCVR
CONTROL
PC-RXD
PC-TXD
RXD
TXD
U20A
U20B
74LVC125A
DN5
DN6
BAV99
LED1
LED2
GREEN/RED
R122
R123
R124
R125
330
OPER-LED1
OPER-LED2
WARN-LED1
WARN-LED2
Q16
Q17
Q18
Q19
J10
J11
20L2001002
TP40
TP41
TP42
TP43
R120
4.7K
R581
R121
LAMPDOOR
Q102
Q14
R579
FRONTDOOR
L29
L30
120 OHM


These parts of this portion should be connected closely.
The trace width of this portion should be greater than 25 mils.
J13
2210218261
VCC
DATA-
DATA+
GND
G1
G2
TP173
TP174
TP175
TP176
USB-V
USB-D-A
USB-D+A
USB-GND
L14
L15
L16
80 OHM
L17 80 OHM
D9
D10
D11
TZMC5V1
C142 47P J
C143 47P J
C144 0.1U Z
C141 10U 16V
R144 4.7K
R143 20K
VUSB-A
C145 0.1U Z
VUSB
USB-D-
USB-D+
C136 10U 16V
D8 TZMC5V1
C137 0.1U K
C138 4.7U 25V
C139 0.1U K
VR-A
R584 1.5K
U25
VDD
VR
VSS
USBMD
Iclk
Idata
D-
D+
X1
X2
data
RST
KI0
KI1
KI2
KI3
K01
K02
DSW
NC
MC68HC908JB8
Y3
6MHZ
R145 10M
USB-X2
USB-X1
C146 20P J
C147 20P J
RST-A
R142 20K
C140 0.1U K
R140 47
P5V
U111
OE
A
Y
74LVC1G126
IRRCVR

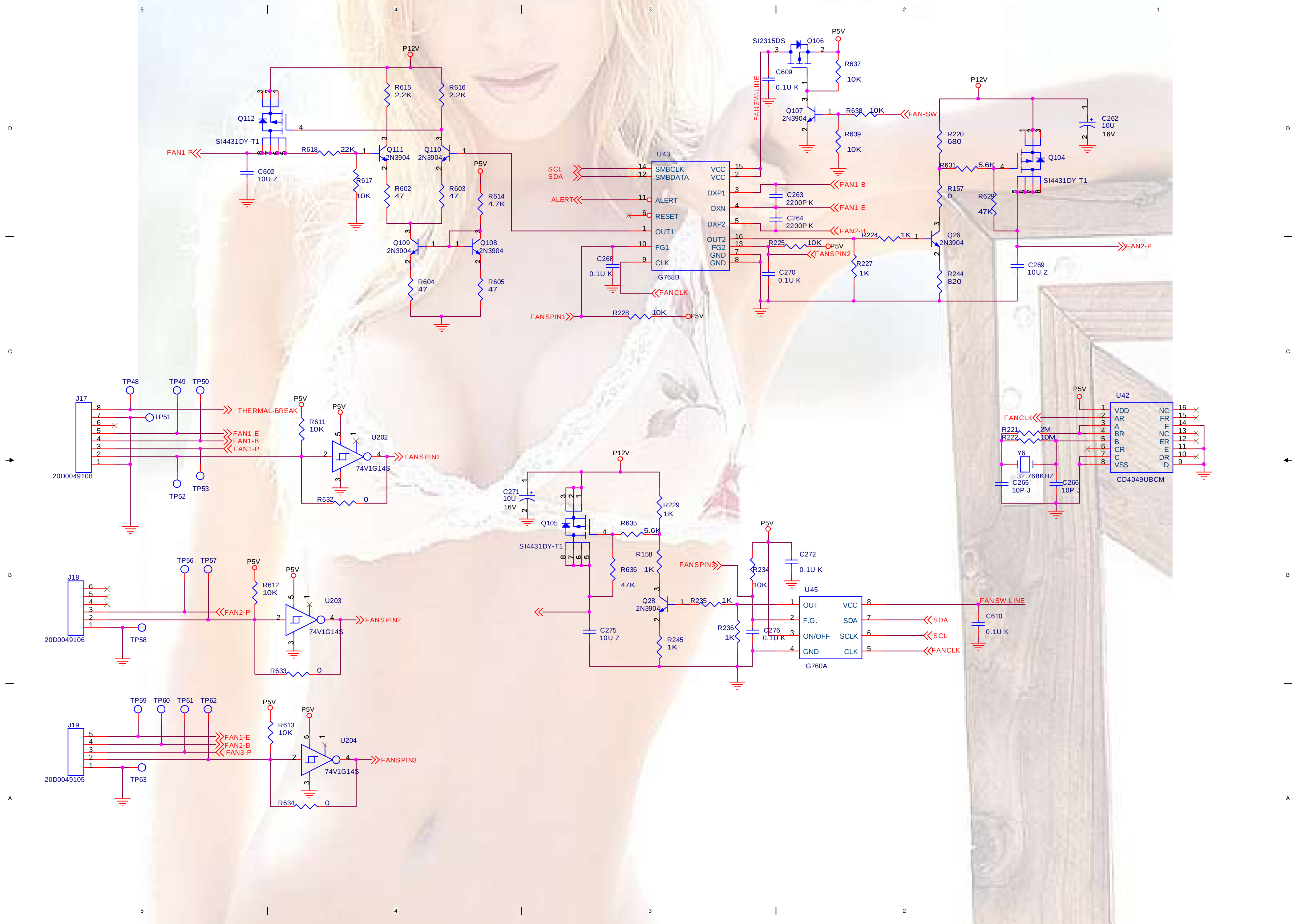

CAREFULY LAYOUT
GHS1
R161 1K
GHS
PVDD
C182 3900P K
C183 39N K
REF-A
R166 3.3K
GFILT
GVMID
P5V
U29
VIN VOUT
GND
LD1117-3.3V
C172 0.1U Z
C169 22U 6.3V
C173 C174 C175 C176 C177 C178 0.1U Z
AVDD
U30
LD1117-3.3V
C179 0.1U Z
C170 22U 6.3V
C180 C181 0.1U Z
PVDD
P3P3V
V33
L22 120 OHM
C185 22U 6.3V
C186 C187 C188 C189 C190 C191 0.1U Z
GCOAST
HSYNC
VSYNC
GBLKSPL
AVDD
V33
C192 0.1U Z
BAIN
R167 68
GBIN-A
C193 0.047U K GBIN
C194 10P J
GAIN
R168 68
GGIN-A
C195 0.047U K GGIN
C196 1000P J SOGIN1
R242 1.5K
C197 10P J
RAIN
R169 68
GRIN-A
C198 0.047U K GRIN
C199 10P J
SCL
SDA
GVREF
C200 0.1U Z
U32
AD9883AKST-140
GND VD BAIN GND VD VD GND GAIN SOGIN GND VD VD GND RAIN A0 SCL SDA REF BYPASS VD GND
GND VD CLAMP MIDSCV PVD PVD FILT GND VSYNC HSYNC COAST GND VD VD GND GND VDD VDD GND
GND B0 B1 B2 B3 B4 B5 B6 B7 VDD GND G0 G1 G2 G3 G4 G5 G6 G7 GND
GND VD GND VSOUT SOGOUT HSOUT DATACK GND VDD R7 R6 R5 R4 R3 R2 R1 R0 VDD VDD GND
ADBE0 ADBE1 ADBE2 ADBE3 ADBE4 ADBE5 ADBE6 ADBE7
RN16 22
RN17 22
GBE0 GBE1 GBE2 GBE3 GBE4 GBE5 GBE6 GBE7
GBE[0:7]
V33
ADGE0 ADGE1 ADGE2 ADGE3 ADGE4 ADGE5 ADGE6 ADGE7
RN18 22
RN19 22
GGE0 GGE1 GGE2 GGE3 GGE4 GGE5 GGE6 GGE7
GGE[0:7]
ADRE0 ADRE1 ADRE2 ADRE3 ADRE4 ADRE5 ADRE6 ADRE7
RN20 22
RN21 22
GRE0 GRE1 GRE2 GRE3 GRE4 GRE5 GRE6 GRE7
GRE[0:7]
V33
ADVS ADSOG ADHS ADCK
47 47 47 22
GCLK
GFBK
GHS1
GVS
C201 20P J

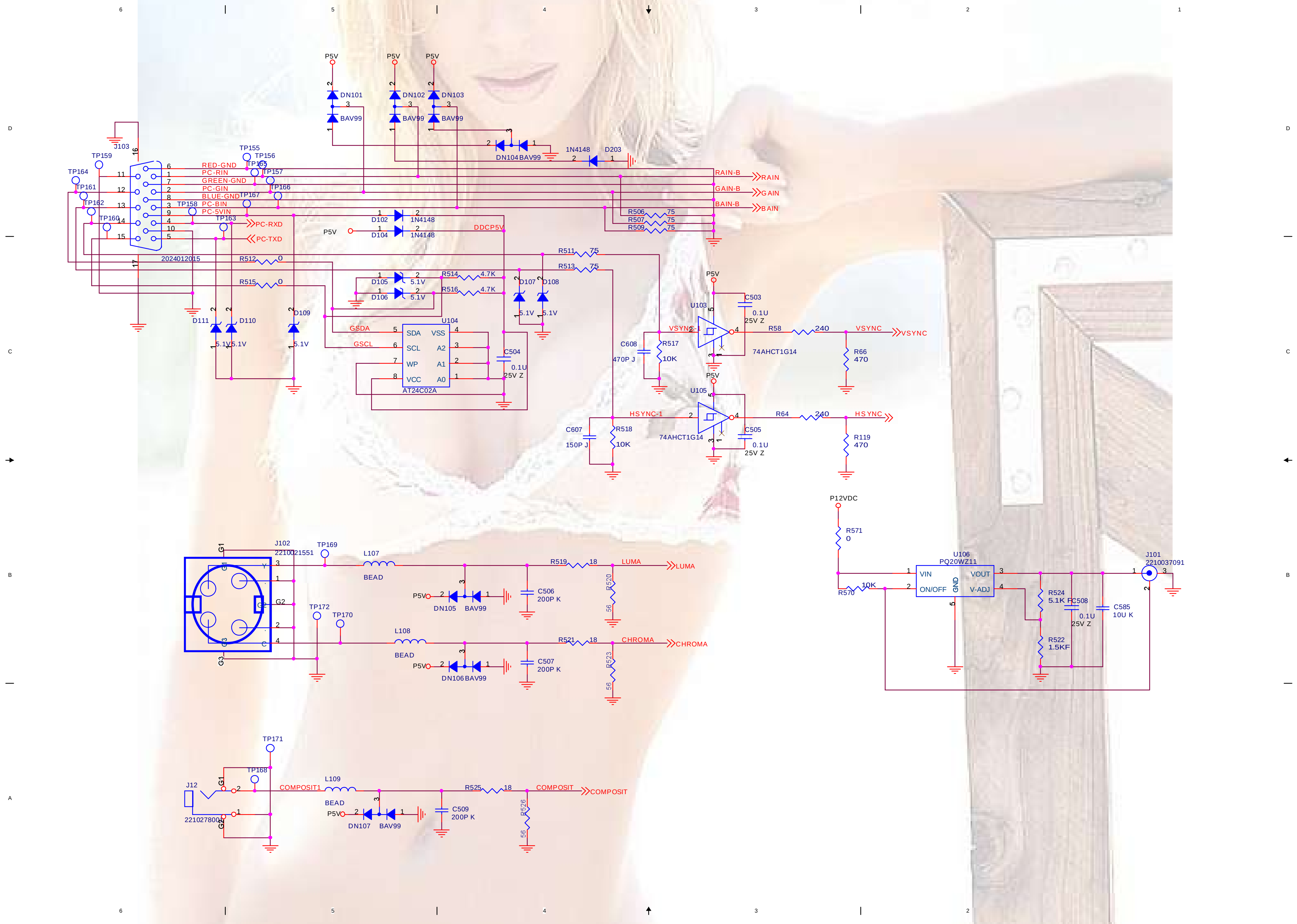


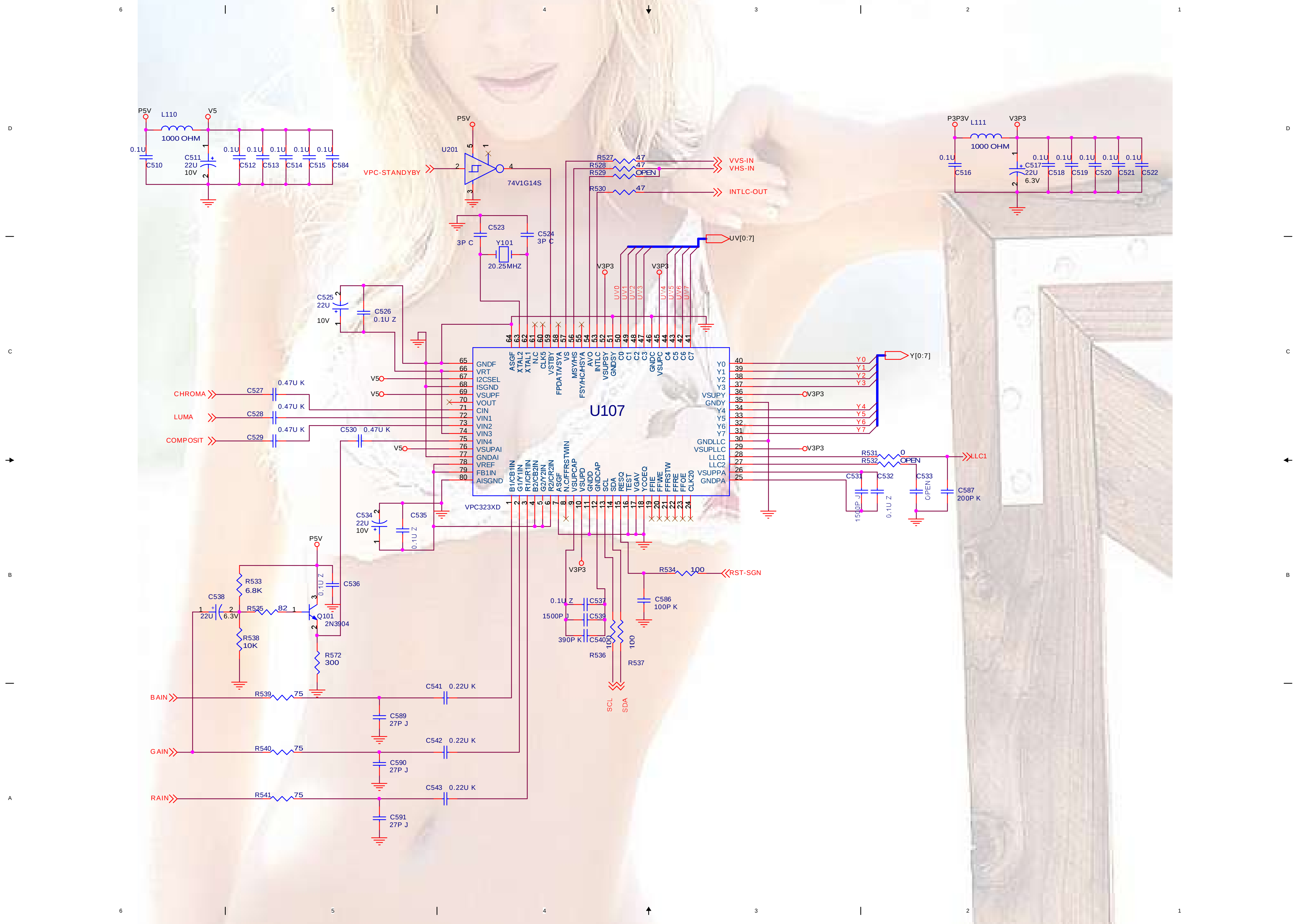
U35A
PW166-10TK
Graphics Port
U35B
PW166-10TK
Video Port
U35D
PW166-10TK
Misc
U35C
PW166-10TK
Display Port
U35E
PW166-10TK
Power and Ground
U36
MIC39100
J15
20K2169032
GFBK
GCLK
GVS
GHS
GRE[0:7]
GGE[0:7]
GBE[0:7]
GBLKSPL
GCOAST
VCLK
VPEN
VVS
VHS
VY[0:7]
VUV[0:7]
RESET_PW
MCKEXT
DCKEXT
RXD
TXD
IRRCVR
SDA
SCL
USBSW
ALERT
FAN-SW
RST-SGN
D-FLIP
CONTROL
PWRGOOD
RESETZ
LAMPLIT-PW
VPC-STANDBY
OPER-LED1
OPER-LED2
WARN-LED1
WARN-LED2
D[0:15]
ROMOEn
ROMWEn
RAMOEn
RAMWEn
CS0n
NMI
TDI
CLKIN
VSYNCZ
HSYNCZ
ACTDATA
RV[0:7]
GY[0:7]
BU[0:7]
C222 10P J
C223 22U 6.3V
C224 22U 6.3V
C229 4.7U Z 50V
C240 22U 6.3V
L27 120 OHM
L28 120 OHM
P3P3V
V25
V3P
2P5V
P5V



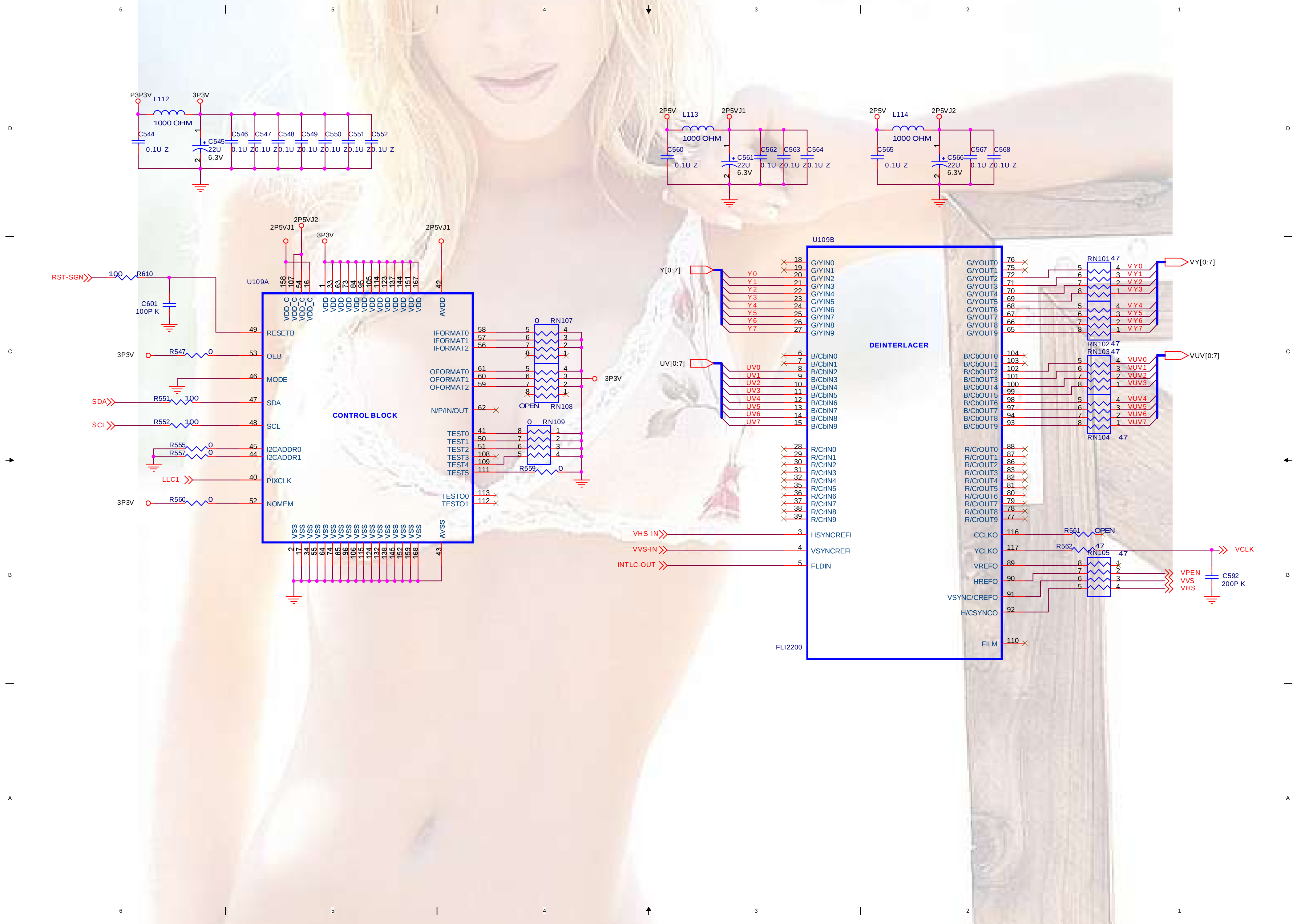
P3P3V
SW3
6240019001
R237
1M
U38
AT49BV8192A(T)
CE
OE
WE
RP
WP
BYTE
VPP
VCC
GND
C251
0.1U Z
R578
OPEN
D[0:15]
ROMOEn
ROMWEn
R208
3.3K
R209
3.3K
J16
20L1023060
P5V
IRPn
IA20
IA21
R212 3.3K
R214 3.3K
R216 3.3K
R217 3.3K
L301
120 OHM
C252
0.1U Z
U37
ICS501
OE
S0
S1
X1
X2
VDD
CLK
GND
Y4
16.257MHZ
U18-X1
U18-X2
R207
820K
C253
10P J
C254
10P J
RMCK
R206
4.7
MCKEXT
L302
120 OHM
C255
0.1U Z
U39
ICS501
Y5
10MHZ
U17-X1
U17-X2
R211
820K
C256
10P J
C257
10P J
RDCK
R210
22
DCKEXT
C258
0.1U Z
U40
V6300L
NC
VSS
RES
RESET-I
R213
1K
RESET
R215
2K
R218
2K
U41
AT24C16 16K
VCC
WP
SCL
SDA
C259
0.1U Z


P12V
R615
2.2K
R616
2.2K
Q112
SI4431DY-T1
FAN1-P
R618
22K
C602
10U Z
R617
10K
Q111
2N3904
Q110
2N3904
R602
47
R603
47
P5V
R614
4.7K
Q109
2N3904
Q108
2N3904
R604
47
R605
47
SCL
SDA
ALERT
U43
SMBCLK
SMBDATA
ALERT
RESET
OUT1
FG1
CLK
VCC
VCC
DXP1
DXN
DXP2
OUT2
FG2
GND
GND
G768B
C268
0.1U K
FANCLK
FANSPIN1
R228
10K
SI2315DS
Q106
C609
0.1U K
FANSW-LINE
R637
10K
Q107
2N3904
R638
10K
FAN-SW
R639
10K
C263
2200P K
C264
2200P K
FAN1-B
FAN1-E
FAN2-B
R225
10K
FANSPIN2
R227
1K
C270
0.1U K
R220
680
R631
5.6K
Q104
SI4431DY-T1
C262
10U
16V
R157
0
R629
47K
R224
1K
Q26
2N3904
FAN2-P
R244
820
C269
10U Z
J17
TP48
TP49
TP50
TP51
THERMAL-BREAK
FAN1-E
FAN1-B
FAN1-P
20D0049108
TP52
TP53
R611
10K
U202
74V1G14S
FANSPIN1
R632
0
U42
VDD
AR
A
BR
B
CR
C
VSS
NC
FR
F
NC
ER
E
DR
D
CD4049UBCM
FANCLK
R221
2M
R222
10M
Y6
32.768KHZ
C265
10P J
C266
10P J
C271
10U
16V
Q105
SI4431DY-T1
R635
5.6K
R229
1K
R158
1K
R636
47K
Q28
2N3904
R235
1K
C275
10U Z
R245
1K
FANSPIN3
R234
10K
C272
0.1U K
U45
OUT
F.G.
ON/OFF
GND
VCC
SDA
SCLK
CLK
G760A
R236
1K
C276
0.1U K
FANSW-LINE
C610
0.1U K
SDA
SCL
FANCLK
J18
TP56
TP57
FAN2-P
20D0049106
TP58
R612
10K
U203
74V1G14S
FANSPIN2
R633
0
J19
TP59
TP60
TP61
TP62
FAN1-E
FAN2-B
FAN3-P
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TP63
R613
10K
U204
74V1G14S
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R634
0

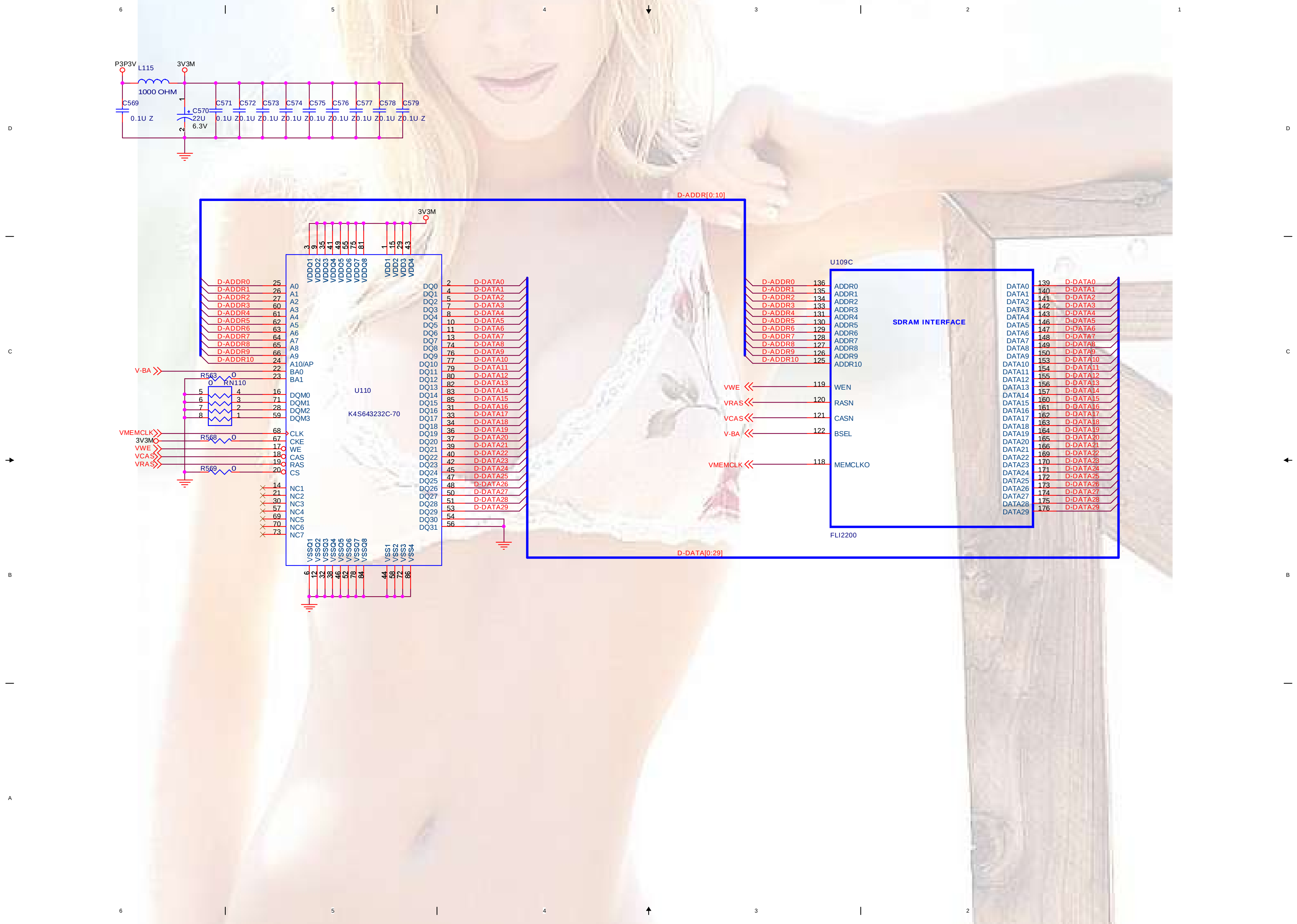

J103
2024012015
TP155
TP156
TP157
TP159
TP161
TP162
TP163
TP164
TP165
TP166
TP167
TP158
TP160
RED-GND
PC-RIN
GREEN-GND
PC-GIN
BLUE-GND
PC-BIN
PC-5VIN
PC-RXD
PC-TXD
P5V
DN101
DN102
DN103
BAV99
DN104
1N4148
D203
D102
D104
DDCP5V
RAIN-B
RAIN
GAIN-B
GAIN
BAIN-B
BAIN
R506 75
R507 75
R509 75
R511 75
R513 75
R512 0
R515 0
R514 4.7K
R516 4.7K
D105
D106
5.1V
D107
D108
D109
D110
D111
U104
AT24C02A
SDA
SCL
WP
VCC
VSS
A2
A1
A0
GSDA
GSCL
C504
0.1U
25V Z
U103
C503
VSYNC-1
R58 240
VSYNC
74AHCT1G14
C608
470P J
R517
10K
R66
470
U105
HSYNC-1
R64 240
HSYNC
C505
C607
150P J
R518
R119
P12VDC
R571
0
U106
PQ20WZ11
VIN
ON/OFF
GND
VOUT
V-ADJ
R570 10K
R524
5.1K F
C508
R522
1.5KF
C585
10U K
J101
2210037091
J102
2210021551
TP169
TP170
TP171
TP172
TP168
L107
L108
L109
BEAD
R519 18
LUMA
R520
56
DN105
DN106
DN107
C506
200P K
C507
200P K
C509
200P K
R521 18
CHROMA
R523
R525 18
COMPOSIT1
COMPOSIT
R526
J12
2210278001



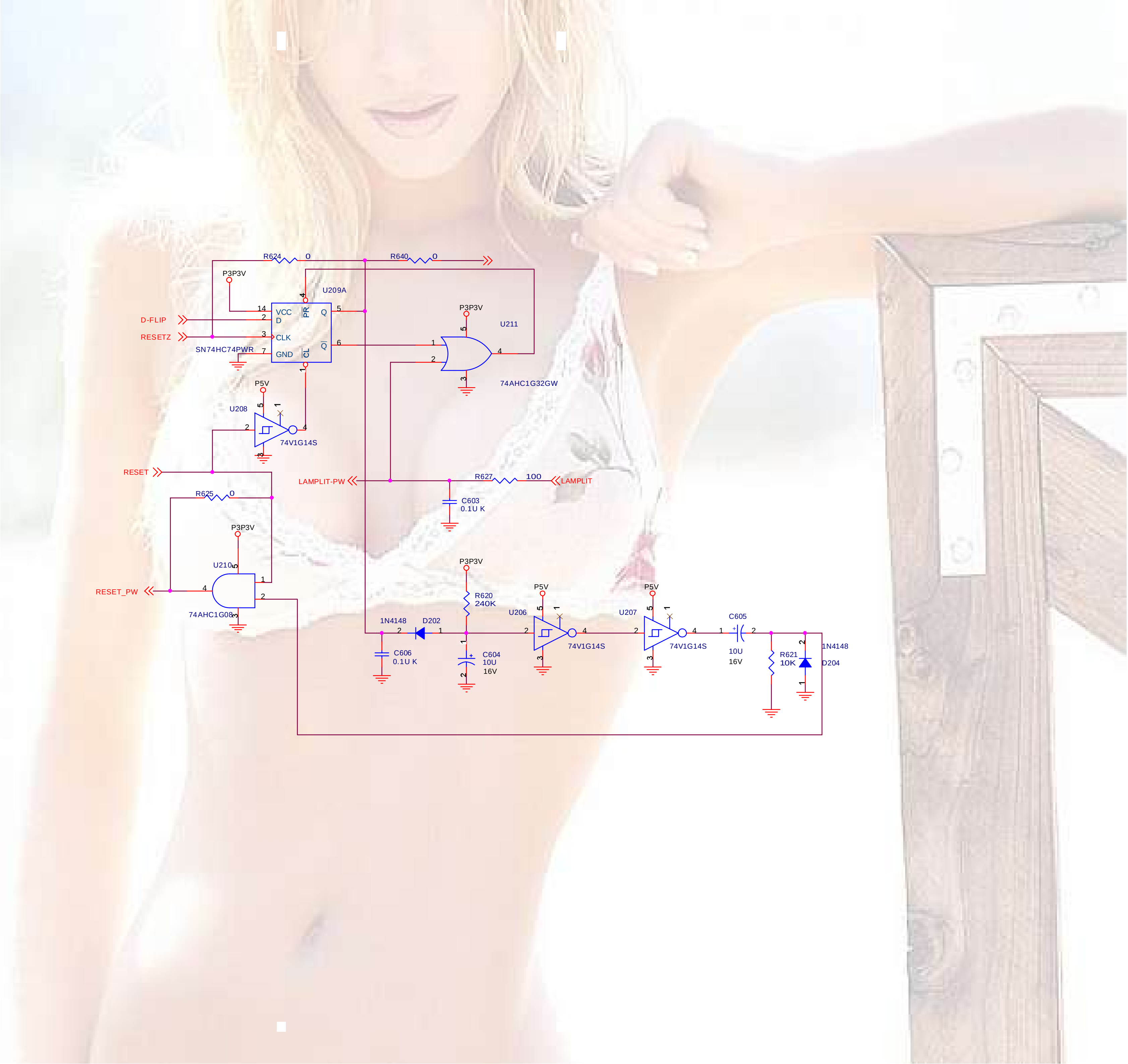
P5V
L110
1000 OHM
V5
0.1U
C510
C511
22U
10V
C512
C513
C514
C515
C584
U201
74V1G14S
VPC-STANDBY
R527 47
R528 47
R529 OPEN
R530 47
VVS-IN
VHS-IN
INTLC-OUT
UV[0:7]
C523
3P C
C524
3P C
Y101
20.25MHZ
V3P3
UV0
UV1
UV2
UV3
UV4
UV5
UV6
UV7
C525
22U
10V
C526
0.1U Z
P3P3V
L111
1000 OHM
V3P3
C516
C517
22U
6.3V
C518
C519
C520
C521
C522
U107
VPC323XD
GNDF
VRT
I2CSEL
ISGND
VSUPF
VOUT
CIN
VIN1
VIN2
VIN3
VIN4
VSUPAI
GNDAI
VREF
FB1IN
AISGND
ASGF
XTAL2
XTAL1
N.C
CLK5
VSTBY
FPDAT/VSYA
VS
MSY/HS
FSY/HC/HSYA
AVO
INTLC
VSUPSY
GNDSY
C0
C1
C2
C3
GNDC
VSUPC
C4
C5
C6
C7
Y0
Y1
Y2
Y3
VSUPY
GNDY
Y4
Y5
Y6
Y7
GNDLLC
VSUPLLC
LLC1
LLC2
VSUPPA
GNDPA
B1/CB1IN
G1/Y1IN
R1/CR1IN
B2/CB2IN
G2/Y2IN
R2/CR2IN
ASGF
N.C/FFRSTWIN
VSUPCAP
VSUPD
GNDD
GNDCAP
SCL
SDA
RESQ
TEST
VGAV
YCOEQ
FFIE
FFWE
FFRSTW
FFRE
FFOE
CLK20
Y[0:7]
R531 0
R532 OPEN
LLC1
C531
1500P J
C532
0.1U Z
C533
OPEN
C587
200P K
CHROMA
C527
0.47U K
LUMA
C528
0.47U K
COMPOSIT
C529
0.47U K
C530 0.47U K
C534
22U
10V
C535
0.1U Z
P5V
C536
0.1U Z
R533
6.8K
C538
22U
6.3V
R535 82
Q101
2N3904
R538
10K
R572
300
BAIN
R539 75
C541 0.22U K
C589
27P J
GAIN
R540 75
C542 0.22U K
C590
27P J
RAIN
R541 75
C543 0.22U K
C591
27P J
0.1U Z C537
1500P J C539
390P K C540
R536
100
R537
100
SCL
SDA
R534 100
RST-SGN
C586
100P K



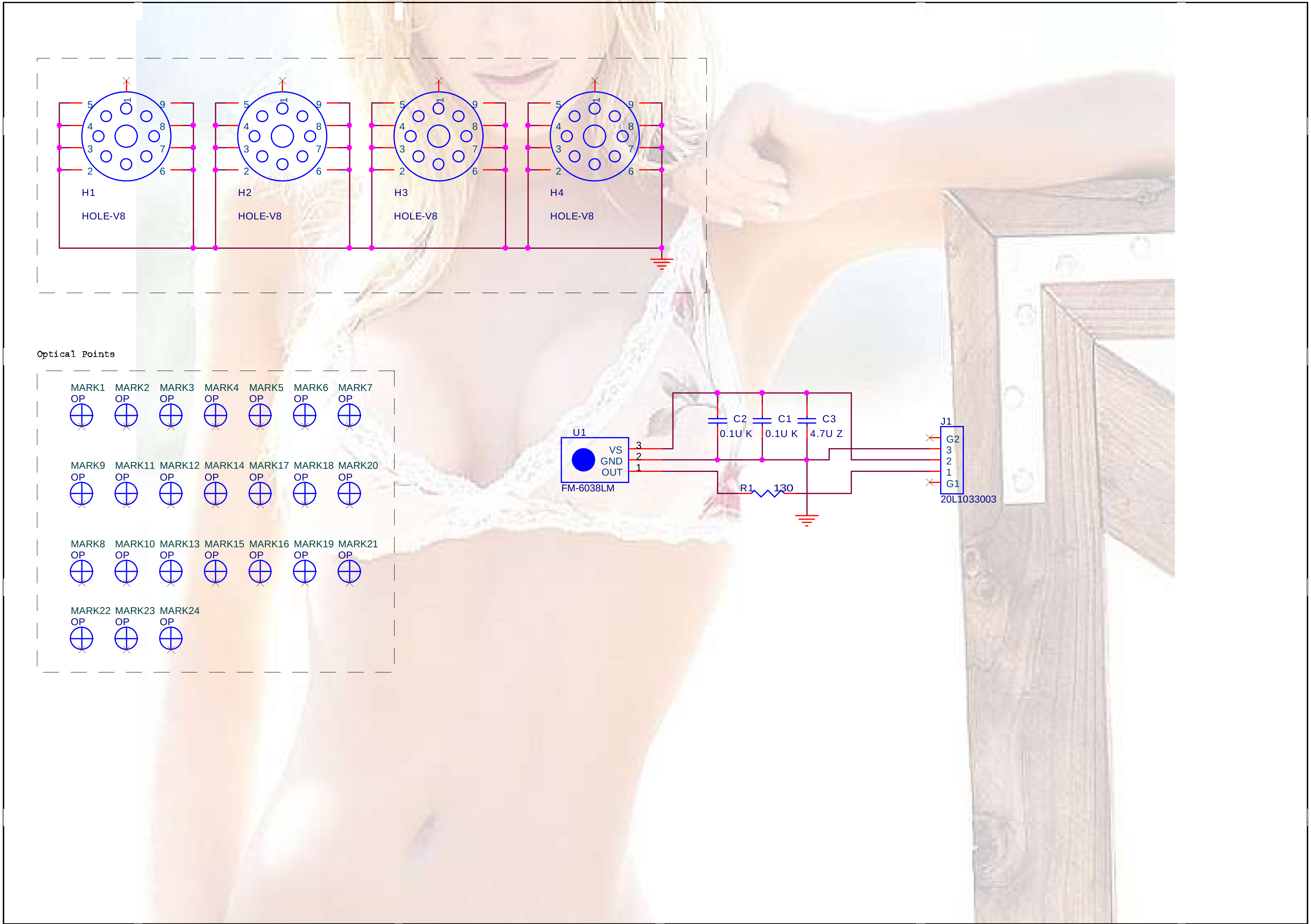
P3P3V
L112
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3P3V
C544
0.1U Z
C545
22U
6.3V
C546
C547
C548
C549
C550
C551
C552
0.1U Z
2P5V
L113
2P5VJ1
C560
C561
C562
C563
C564
L114
2P5VJ2
C565
C566
C567
C568
RST-SGN
100
R610
C601
100P K
U109A
2P5VJ1
2P5VJ2
3P3V
VDD_C
VDD
AVDD
RESETB
OEB
MODE
SDA
SCL
I2CADDR0
I2CADDR1
PIXCLK
NOMEM
R547
R551
R552
R555
R557
R560
LLC1
CONTROL BLOCK
IFORMAT0
IFORMAT1
IFORMAT2
OFORMAT0
OFORMAT1
OFORMAT2
N/P/IN/OUT
TEST0
TEST1
TEST2
TEST3
TEST4
TEST5
TESTO0
TESTO1
VSS
AVSS
RN107
RN108
OPEN
RN109
R559
U109B
Y[0:7]
UV[0:7]
G/YIN0
G/YIN1
G/YIN2
G/YIN3
G/YIN4
G/YIN5
G/YIN6
G/YIN7
G/YIN8
G/YIN9
B/CbIN0
B/CbIN1
B/CbIN2
B/CbIN3
B/CbIN4
B/CbIN5
B/CbIN6
B/CbIN7
B/CbIN8
B/CbIN9
R/CrIN0
R/CrIN1
R/CrIN2
R/CrIN3
R/CrIN4
R/CrIN5
R/CrIN6
R/CrIN7
R/CrIN8
R/CrIN9
HSYNCREFI
VSYNCREFI
FLDIN
VHS-IN
VVS-IN
INTLC-OUT
DEINTERLACER
FLI2200
G/YOUT0
G/YOUT1
G/YOUT2
G/YOUT3
G/YOUT4
G/YOUT5
G/YOUT6
G/YOUT7
G/YOUT8
G/YOUT9
B/CbOUT0
B/CbOUT1
B/CbOUT2
B/CbOUT3
B/CbOUT4
B/CbOUT5
B/CbOUT6
B/CbOUT7
B/CbOUT8
B/CbOUT9
R/CrOUT0
R/CrOUT1
R/CrOUT2
R/CrOUT3
R/CrOUT4
R/CrOUT5
R/CrOUT6
R/CrOUT7
R/CrOUT8
R/CrOUT9
CCLKO
YCLKO
VREFO
HREFO
VSYNC/CREFO
H/CSYNCO
FILM
RN101 47
RN102 47
RN103 47
RN104 47
RN105 47
R561 OPEN
R562 47
VY[0:7]
VUV[0:7]
VCLK
VPEN
VVS
VHS
C592
200P K



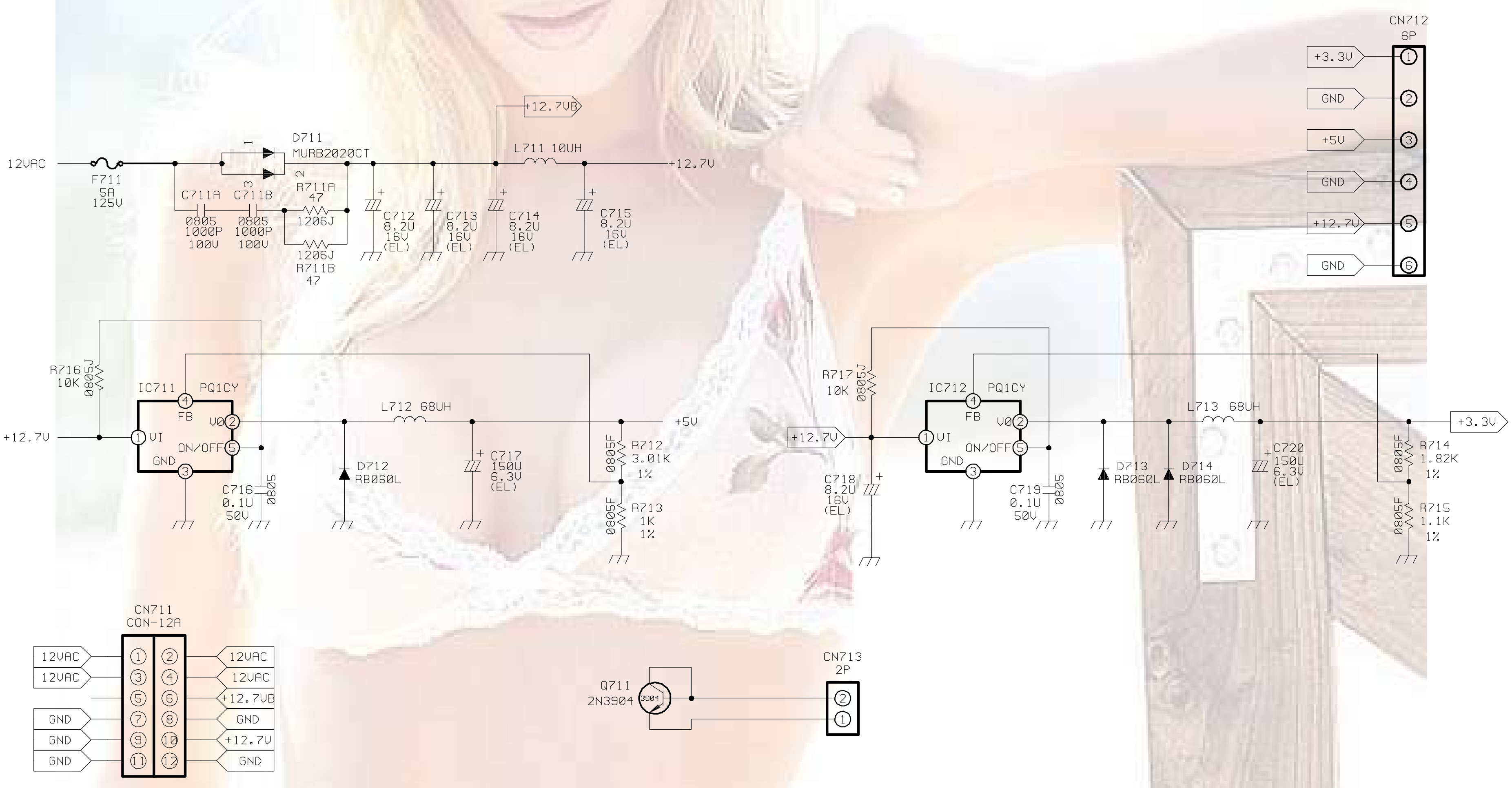
P3P3V
L115
1000 OHM
3V3M
C569
0.1U Z
C570
22U
6.3V
C571
C572
C573
C574
C575
C576
C577
C578
C579
0.1U Z
D-ADDR[0:10]
3V3M
U110
K4S643232C-70
VDDQ1 VDDQ2 VDDQ3 VDDQ4 VDDQ5 VDDQ6 VDDQ7 VDDQ8
VDD1 VDD2 VDD3 VDD4
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10/AP
BA0 BA1
DQM0 DQM1 DQM2 DQM3
CLK CKE WE CAS RAS CS
NC1 NC2 NC3 NC4 NC5 NC6 NC7
DQ0 DQ1 DQ2 DQ3 DQ4 DQ5 DQ6 DQ7 DQ8 DQ9 DQ10 DQ11 DQ12 DQ13 DQ14 DQ15 DQ16 DQ17 DQ18 DQ19 DQ20 DQ21 DQ22 DQ23 DQ24 DQ25 DQ26 DQ27 DQ28 DQ29 DQ30 DQ31
VSSQ1 VSSQ2 VSSQ3 VSSQ4 VSSQ5 VSSQ6 VSSQ7 VSSQ8
VSS1 VSS2 VSS3 VSS4
D-ADDR0 D-ADDR1 D-ADDR2 D-ADDR3 D-ADDR4 D-ADDR5 D-ADDR6 D-ADDR7 D-ADDR8 D-ADDR9 D-ADDR10
D-DATA0 … D-DATA29
V-BA
R563 0
RN110
VMEMCLK
3V3M
VWE
VCAS
VRAS
R568 0
R569 0
D-DATA[0:29]
U109C
SDRAM INTERFACE
ADDR0 ADDR1 ADDR2 ADDR3 ADDR4 ADDR5 ADDR6 ADDR7 ADDR8 ADDR9 ADDR10
WEN
RASN
CASN
BSEL
MEMCLKO
DATA0 … DATA29
VWE
VRAS
VCAS
V-BA
VMEMCLK
FLI2200



R624 0
R640 0
P3P3V
U209A
D-FLIP
RESETZ
SN74HC74PWR
VCC
D
CLK
GND
PR
CL
Q
P3P3V
U211
74AHC1G32GW
P5V
U208
74V1G14S
RESET
LAMPLIT-PW
R627 100
LAMPLIT
C603
0.1U K
R625 0
P3P3V
U210
RESET_PW
74AHC1G08
P3P3V
R620
240K
P5V
U206
74V1G14S
P5V
U207
74V1G14S
C605
10U
16V
1N4148
D202
C606
0.1U K
C604
10U
16V
R621
10K
1N4148
D204



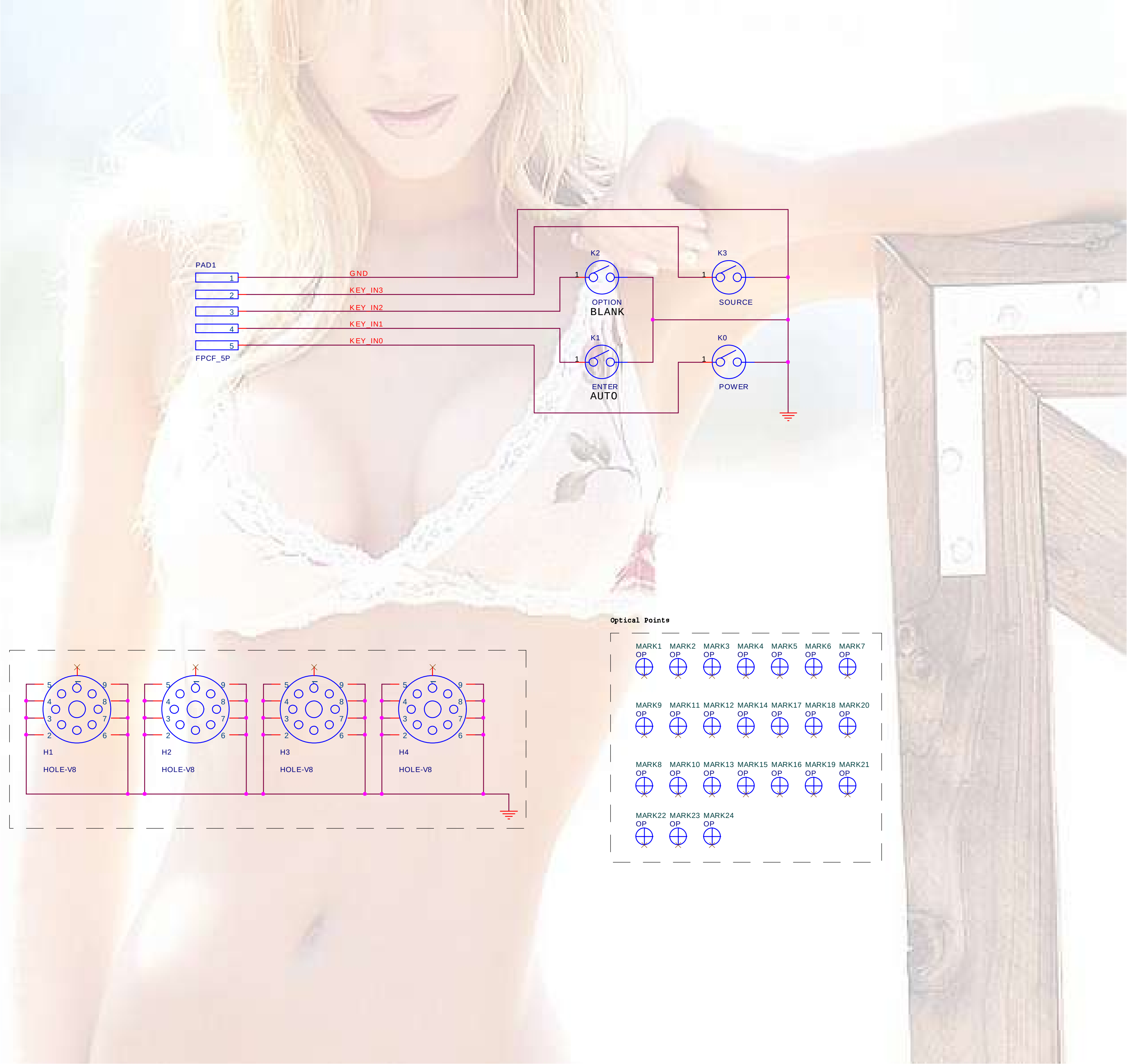
H1
HOLE-V8
H2
HOLE-V8
H3
HOLE-V8
H4
HOLE-V8
Optical Points
MARK1 OP
MARK2 OP
MARK3 OP
MARK4 OP
MARK5 OP
MARK6 OP
MARK7 OP
MARK9 OP
MARK11 OP
MARK12 OP
MARK14 OP
MARK17 OP
MARK18 OP
MARK20 OP
MARK8 OP
MARK10 OP
MARK13 OP
MARK15 OP
MARK16 OP
MARK19 OP
MARK21 OP
MARK22 OP
MARK23 OP
MARK24 OP
U1
VS
GND
OUT
FM-6038LM
C2
0.1U K
C1
0.1U K
C3
4.7U Z
R1
130
J1
G2
3
2
1
G1
20L1033003

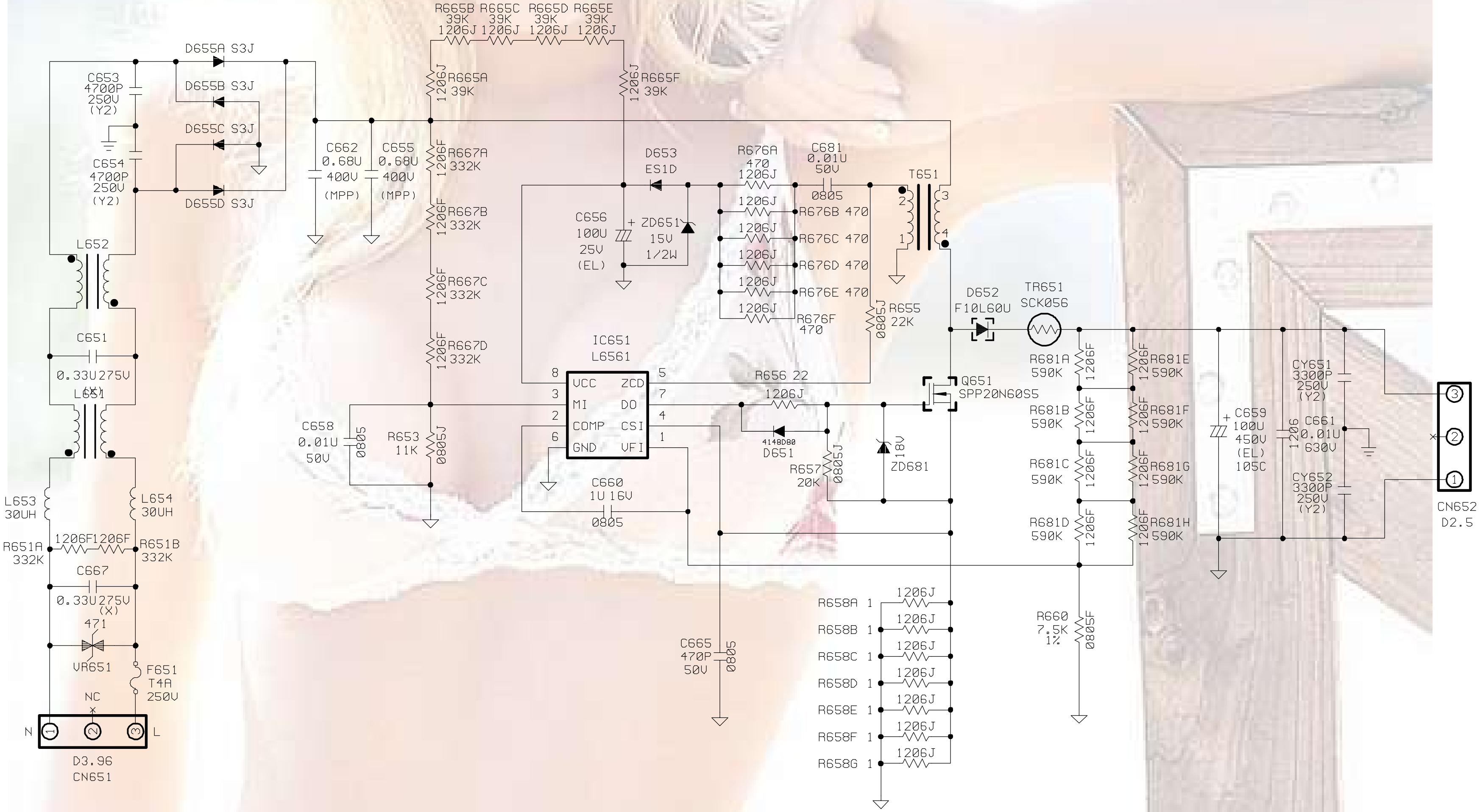


NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm

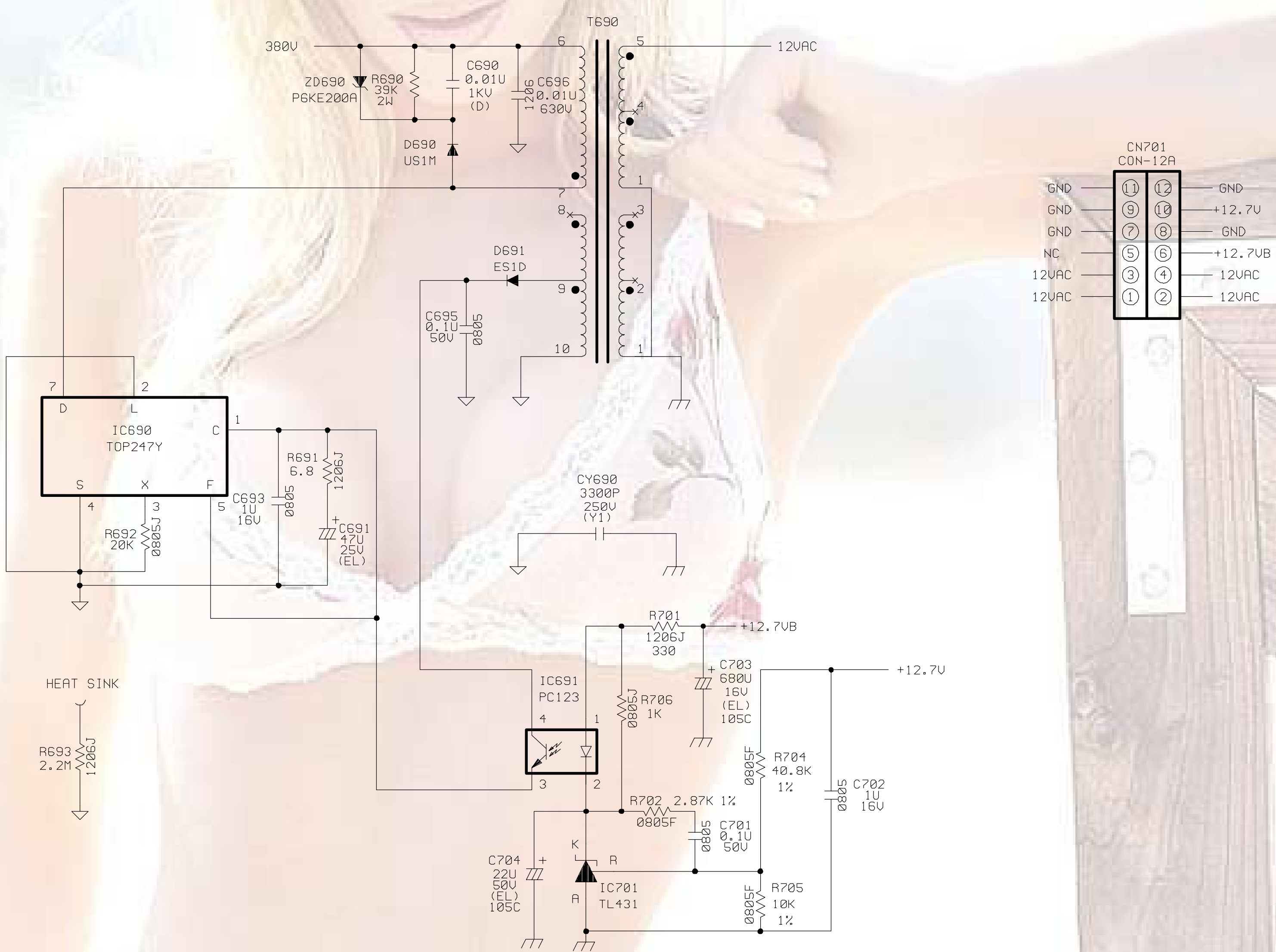
2. All resistors are 1/8 watt, 5% except where otherw

3. Represents PCB common ground.


PAD1
1
2
3
4
5
FPCF_5P
GND
KEY_IN3
KEY_IN2
KEY_IN1
KEY_IN0
K2
OPTION
BLANK
K3
SOURCE
K1
ENTER
AUTO
K0
POWER
H1
HOLE-V8
H2
HOLE-V8
H3
HOLE-V8
H4
HOLE-V8
Optical Points
MARK1 MARK2 MARK3 MARK4 MARK5 MARK6 MARK7
MARK9 MARK11 MARK12 MARK14 MARK17 MARK18 MARK20
MARK8 MARK10 MARK13 MARK15 MARK16 MARK19 MARK21
MARK22 MARK23 MARK24
OP



NOTES:1.Resistor values are in ohm,K=1,000 ohm,M=1,000,000 ohm
2.All resistors are 1/8 watt,5% except where otherwise indicated
its PCB common ground.



NOTES:1.Resistor values are in ohm,K=1,000 ohm,M=1,000,000 ohm

2.All resistors are 1/8 watt,5% except where otherwise indicated

its PCB common ground.



LG Electronics Inc.

P/NO : 3828VD0144C

May.2003
Printed in Taiwan

Chapter 1 Engineering Specification

1.0 Optical Performance	Tested under 60” (diagonal) image size unless other specified. Measurement Details refer to Appendix A.	
1.1 ANSI Brightness		
1.1.2 Minimum	650	
1.2 Brightness Uniformity		
1.2.2 Minimum	75%	
1.3 Contrast Ratio		
1.3.1 ANSI Contrast	250:1	
1.3.2 FOFO Contrast	800:1	
1.4 Light Leakage		
1.4.1 Light Leakage in Active Area	<3.5 lux within 60” (diagonal) image size	
1.4.1 Light Leakage out of Active Area	<3.5 lux between of 60” (diagonal) image size and 80” (diagonal) area	
1.5 Color	x	y
1.5.1 White	0.300	0.370
1.5.4 Red	0.650	0.320
1.5.5 Green	0.350	0.580
1.5.6 Blue	0.140	0.080
1.6 Color Uniformity	x	y
1.6.1 White	±0.04	±0.04
1.6.2 Red	±0.04	±0.04
1.6.3 Green	±0.04	±0.04
1.6.4 Blue	±0.04	±0.04
2.0 Image Quality		
2.1 Throw Ratio	45” ±5% Diagonal at 2m	
2.2 Zoom Ratio	1.3:1	
2.3 Distortion		
2.3.1 Keystone Distortion	<1.15%	
2.3.2 Vertical TV Distortion	<1.0%	
2.4 Projection Offset	128% ±5%	
2.5 Focus Range	1.5~8m	
2.6 Focus	Test Pattern: Croma 84 X pattern Observation: 1m from observer to screen Criteria: 2M X clear all over screen	

	(Clear level specified by limit sample) 1.5M and 8M X Visible all over screen (Visible level specified by limit sample Focus condition: uniformly focused by oberver
2.7 Lateral Color	<2/3 Pixel
2.8 DMD Image Quality	See Appendix D
3.0 Mechanical Specification	
3.1 Dimensions	248.7L x 170.5W x 59H major (mm)
3.2 Weight	

7.0 Regulatory	Safety	UL Approved (UL 1950, CSA950), TUV-GS, CCC, CB Report
	EMC	FCC Class B requirements, BSMI, VCCI, C-Tick
	CE Marks	Directive 73/23/EEC;
		Directive 89/336/EEC;
	ESD	Air 8KV, Contact 6KV, Criteria B
8.0 Reliability		
8.1 General Failure Def.	Adhere to Appendix B	
8.2 MTBF	12000 hours except for DMD panel, Lamp and Fan	
8.3 Lamp lifetime	1000 (50% Brightness Maintenance)	
9.0 Power Requirements	Adhere to Appendix F	
9.1 Power Supply	VAC 100 – 240 Auto switch (50/60Hz), 3 Wire Grounded	
9.2 Power Consumption	Normal operation	< 240W
	Standby	< 15W
9.3 Power Connector	IEC320 C6	
10.0 Panel and Lamp Specification	Spec. refer to Appendix D	
10.1 DMD Type	0.55” DDR SVGA DMD chip	
10.2 DMD Pixels	800x600	
10.3 Aspect Ratio	4:3	
10.4 Lamp Type	Ushio 150 Watt DC lamp	
11.0 Compatibility		
11.1 PC	PC Compatible VGA, SVGA, XGA, SXGA; Macintosh	
11.2 Video	NTSC/ NTSC4.43/ PAL (Including PAL-M, PAL-N)/ SECAM/ PAL60/	
11.3 YP_bP_r	480i, 480p, HDTV (720P/1080i)	
11.4 Plug and Play	DDC 2b	
12.0 Image Interface	See Appendix E	
12.1 D-Sub	15 pin D-Sub (Female) x 1 RGB: Video amplitude 1.0 V_{p-p} : Impedance 75Ω H sync/V sync: TTL Level	

12.2 Video Input	RCA jack (Yellow) Video amplitude 1.0 V_{p-p} : Impedance 75Ω
12.3 S-Video Input	4 pin Mini-Din (Female) Y: Luminance amplitude 1.0 V_{p-p} : Impedance 75Ω C: Chroma amplitude 0.268 V_{p-p} : Impedance 75Ω
13.0 Control Interface	
13.1 IR Receiver	IR Receiver X 2 (Front, Rear) Angle: 7m at 15°
13.2 Mouse Emulation	B Type USB Terminal for mouse support
14.0 User Interface	
14.1 Operator Keypad	4 Keys Power; Source; Blank; Auto
14.2 Indicators	2 LEDs: 1. Power On/Off Status LED; 2. Abnormal Status LED
14.3 On Screen Display	According to MRS
14.4 Image Inversion	Mirror, Upside-down, Mirror Upside-down
14.5 Electric Zoom	1X → 32X (Depend on the input resolution) with Pan function
14.6 Electric Keystone	± 15°

Appendix A Optical Measurement

1.Scope:

This document describes critical optical related test definitions and Instructions for data or video projectors. The other general terminologies are specified in ANSI IT7.228-1997.

2.General Requirements

1. The unit under test should be allowed to stabilize without further adjustment for a minimum of 5 minutes, at nominal ambient room temperature of 25°C, before making measurements.
2. Measurements shall take place in a light proof room, where the only source of illumination is the projector. Less than 1 lux of the light on the screen shall be from any source other than the projector.
3. All measurements shall be made on flat screens that do not provide any advantage to the performance of the unit
4. All measurements shall be made at standard color temperature setting, 100% white image (per ANSI IT7.228-1997), except where noted

3.Practical Requirements

1. When measuring contrast manually, operators should not wear white clothing since light reflected from white clothing can influence the measurement.
2. Unless otherwise specified, the projection lens is set in the widest zoom position since zoom function can influence the measurement.
3. Measurement should be performed with Minolta Chromameter, Model CL-100, or equivalent.

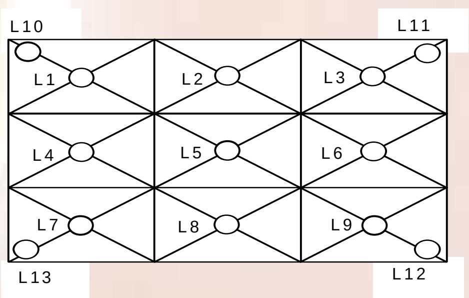
A1. ANSI BRIGHTNESS

ANSI Lumens = (L1+L2+L3+L4+L5+L6+L7+L8+L9)/9 (lux) x A(m^2)

A (Area) = W * H (m^2)

W: width of projected image (m)

H: height of projected image (m)



Note: L10, L11, L12, L13 are located at 10% of the distance from corner itself to L5

A2. BRIGHTNESS UNIFORMITY

Brightness Uniformity = Minimum (L10,L11,L12,L13)/ Average (L1,L2,L3,L4,L5,L6,L7,L8,L9)

A3. JBMA UNIFORMITY

JBMA Uniformity = Average (L1,L3,L7,L9)/ L5

A4. ANSI CONTRAST

ANSI Contrast = Average lux value of the white rectangles/Average lux value of the black rectangles

Contrast Ratio shall be determined from illuminance values obtained from a black-and-white ”chessboard” pattern consisting of 16 equal rectangles. The white rectangles shall be at 100% gray and the black rectangles at 0% gray. Illuminance measurements shall be made at the center of each of the rectangles.

A5. FOFO CONTRAST

FOFO Contrast = Lux value at the center of a solid white screen/the lux value at the center of a solid black screen

A6. JBMA CONTRAST

JBMA Contrast = Average (L1,L2,L3,L4,L5,L6,L7,L8,L9) under solid white / Average (L1,L2,L3,L4,L5,L6,L7,L8,L9) under solid black

A7. LIGHT LEAKAGE

Leakage = The maximum light leakage under a solid black pattern in or outside of the projected image

A8. IMAGE DISTORTION

Keystone = (W2-W1)/ (W1+W2) x 100%

Vertical TV dist = (H1+H2-2xH3)/2H2 x100%

Horizontal TV dist = (W1+W2-2xW3)/2W1 x100%

W1: image width at image bottom

W2: image width at image top

W3: image width at the half image height.

H1: image height at image left

H2: image height at image right

H3: image height at half image

Note:

1. Keystone and Vertical TV Distortion are recommended for Front Projection Display
2. Vertical and Horizontal TV Distortion are recommended for Rear Projection Display

A9. THROW RATIO
Throw ratio = projection distance / the width of the projected image

A10. ZOOM RATIO
Zoom ratio = maximum / minimum image diagonal size at a fixed projection distance

A10. FOCUS RANGE
The minimum/maximum focus distance is the minimum/maximum projection distance (The distance between the outermost element of projection lens and screen), expressed in meter, at which the image is still at its acceptable focus level.(acceptable focus level is specified by FOCUS LIMIT SAMPLE approved by customer)

A11. COLOR
Color is expressed as (x, y) in 1931CIE chromaticity values
Note: Color is measured at the center of the screen that is entirely the measured color under default brightness and contrast settings.

A12. ANSI COLOR
ANSI Color is expressed as (u, v) in 1976 CIE chromaticity values
Note: Color is measured at the center of the screen that is entirely the measured color under default brightness and contrast settings.

A13. COLOR UNIFORMITY

Appendix B Design Verification Test Procedure

B1. Purpose

This standard establishes the environmental specification for projector related products, which defines the level of product performance and reliability in the field. It is not necessary the intent of these specification to simulate a typical user environment, but rather to provide for a level of product robustness that when applied over a wide range of manufacturing variability and environmental usage conditions, which is recommended for product assurance testing reference.

B2. Test Summary

Dynamic Testing	Specification	
Drop	91cm, 1 drop per orientation, all 6 primary surfaces, plus a minimum of one selected corners, and three selected edges, total of 10 drops	
Vibration	**Random**, 0.01G^2/Hz, 5~100Hz, all primary axis, 20 min per orientation, total of 60min **Sine**, 0.5G, 5~200Hz, 1 octave/min, 15 min dwell on each resonant frequency, all primary axis, one sweep (30min minimum) per orientation, total of 90+min	
Shock, non-operating	50G, 20ms half-sine, all primary axis, 1 shock per orientation, total of 3 shocks	
Bench Drop	**Pivot,** 90° , sitting on side opposite to handle, 1 drop per orientation, total of 2 drops **Flat,** 50mm, wooden table, bottom and opposite, 1 drop per orientation, total of 2 drops	
Security Lock	150N break away force	
Fragility	**Shock,** 50G, 20ms half-sine, all primary axis, 1 shock per orientation, total of 3 shocks **Thermal shock (bare board)**, -65~125 ^{o}C, 48hr ***Input Voltage***, 90~264V ***Input RGB signal,*** 0.7V±0.1	
Atmospherics	**Temperature/Humidity, operating**	10~40 ^{o}C /10~90RH, 48hr
	Temperature/Humidity, non-operating	-10~60°C/10~90RH, 48hr
	Altitude, operation	0~6,000ft@30°C, 4hr

B3 Definition

- **Failure Criteria:**

The product is expected to perform to its full potential without loss of function, performance, critical parametric changes, and other undesirable anomalies, over the applied boundaries of this specification. The following product failure are not allowed within the boundaries defined in this specification:

1. Failure including permanent damage, critical parametic changes (optical performance defined in Appendix A), and latent defects.
2. Failure requiring operator intervention.
3. Failure violating external laws, regulatory agency standards, and government directives.
4. Failure resulting in a safety, potential safety, issue.

Peak Acceleration Response divided by acceleration input peak

B4 Test Order

Atmospherics, Dynamic, and Safety test sets require separate units and can be processed in parallel. EUT (EUT: Equipment under Test) testing shall be performed serially within each set.

Set 1 (2 units)	**Set 2 (2 units)**	**Set 3**
Dynamics:	**Atmospherics:**	**Safety/EMC:**
Package Drop	Temperature/Humidity, Operating	EFT
Package Vibration	Temperature/Humidity, Non-operating	ESD
Shock	Altitude, Operating	EMI-Radiated
Bench Drop	Aging	EMI-Conducted
		EMI-Susceptibility

Appendix C Noise Testing Standard

(1) Desk high is 75 cm

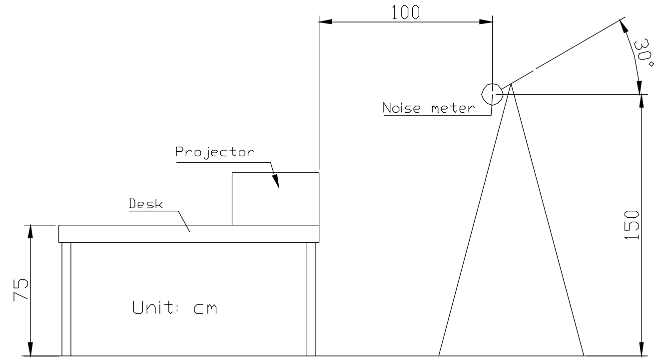
(2) Projector have to closed to the edge of desk

(3) Noise meter high is 150 cm & title 30 degree

(4) The distance between noise meter and projector is 100 cm

(5) Measured four surfaces and calculated the noise value by log average.

(6) We have designed excel files to calculate this value. (Avg_Noise.xls)



We will define the typical value and maximum value for each face in the feature.

Step I: Please Input Measured Noise Value (dB)	(Input)	front	rear	Left	Right
	(Data)	A	B	C	D
Step II: (A~D / 10)	(Process)				
Step III: Power(10,(A~D/10))	(Process)				
Step IV: Sum(Power(10,(ValueA~D/10))/4	(Process)				
Step V: Log10 (StepIV) *10	(Result)				

Appendix D DMD Image Quality

1. SCOPE

This document specifies the image quality requirements applicable to the DLPTM .6SVGA Component Set. The Component Set provides the DLPTM .6SVGA Projector with digital imaging functionality based on Digital Micromirror Device (DMD) technology.

2. Definitions

2.1 Blemish

A blemish is an obstruction, reflection, or refraction of light that is visible, but out of focus in the projected image under specified conditions of inspection (see Table 1). It is caused by a particle, scratch, or other artifact located in the image illumination path.

2.2 Dark pixel

A single pixel or mirror that is stuck in the OFF position and is visibly darker than the surrounding pixels.

2.3 Bright pixel

A single pixel or mirror that is stuck in the ON position and is visibly brighter than the surrounding pixels.

2.4 Unstable pixel

A single pixel or mirror that does not operate in sequence with parameters loaded into memory. The unstable pixel appears to be flickering asynchronously with the image.

2.5 Adjacent pixel

Two or more stuck pixels sharing a common border or common point, also referred to as a cluster.

2.6 Streaks

Artifact resulting from localized variation in mirror tilt angle relative to surrounding mirrors. They are similar in appearance to window scratches but appear at the mirror level. Streaks appear as faint diagonal or arcing patterns in the image.

2.7 Reset boundary artifact

The reset boundary artifact is a single row of pixels on the reset group boundaries that are visibly darker or lighter than the neighboring rows of pixels.

2.8 Pond of Mirrors (POM)

POM is a rectangular array of off-state mirrors surrounding the active area.

2.9 Eyecatcher

Eyecatcher's are blemishes appearing in the area outside of the Active Area. These are due to particles and various DMD window or window aperture “defects” including: digs, voids, and scratches.

2.10 Border Artifacts

Border artifacts are a general category of image artifacts that may show up on screen in the area outside of the active array. Border artifacts include: Exposed Bond Wires, Exposed Metal 2, and Reflective Edge.

2.10.1 Bond Wires

Bond Wires are the electrical connections between the die and the DMD ceramic package. If visible, they will appear as short light parallel lines outside of the Pond of Mirrors (POM).

2.10.2 Exposed Metal 2

Exposed Metal 2 is due to a shift in positioning of either the die or the window aperture, which may allow light to be reflected off of the layer of metal 2 that is below the super structure (mirrors). This defect is located outside of the POM.

2.10.3 Reflective Edge

Reflective Edge is light that may reflect from the edge of the DMD window aperture onto the projection screen. It will appear as a thin diffuse line outside of the POM.

2.11 Two Zone Gray 10 Screen

The Two Zone Gray 10 screen is used to test for Major Light Blemishes, Streaks, Eyecatcher and Border Artifacts. All areas of the screen are colored a Microsoft Paintbrush gray 10 (green, red, and blue set at 10).

NOTE: If linear degamma is not used then the Microsoft Paintbrush values must be adjusted to match the degamma table being used in order to generate an equivalent gray level on the test screen image.

DRAWING NO 2503651 REV A SHEET 3

2.12 Two Zone Blue 60 Screen

The Two Zone Blue 60 screen is used to test for major dark blemishes. Refer to Figure 1 for configuration. All areas of the screen are colored a Microsoft Paintbrush blue 60 (green and red set at 0, blue set at 60).

NOTE: If linear degamma is not used then the Microsoft Paintbrush values must be adjusted to match the degamma table being used in order to generate an equivalent blue level on the test screen image.

2.13 Gray 30 Screen

The Gray 30 screen is used to test for the reset boundary artifact. Refer to Figure 1 for configuration. All areas of the screen are colored a Microsoft Paintbrush gray 30 (green, red, and blue set at 30).

NOTE: If linear degamma is not used then the Microsoft Paintbrush values must be adjusted to match the degamma table being used in order to generate an equivalent gray level on the test screen image.

3. ACCEPTANCE REQUIREMENTS

3.1 Conditions of Acceptance

All DMD image quality returns will be evaluated using the following projected image test conditions:

a. Test Set degamma shall be linear.

b. Test Set brightness and contrast settings shall be set to nominal.

c. The diagonal size of the projected image shall be a minimum of 60 inches.

d. The projection screen shall be 1X gain.

e. The projected image shall be inspected from an 8 feet minimum viewing distance.

f. The image shall be in focus during all Table 1 tests.

3.2 Test Sequence

Tests shall be run in the sequence listed in Table 1.

DRAWING NO 2503651 REV A SHEET 4

TABLE 1. Image Quality Specification

SEQ #	TEST	SCREEN	ACCEPTANCE CRITERIA
1	Major Dark Blemish	Two Zone Blue 60	1. No blemish will be darker than Microsoft Blue 60 in the Critical Zone 2. __ 2 blemishes in the Non-Critical Zone 3. No blemish will be > ½” long/diameter in the Non-Critical Zone
2	Major Light Blemish	Two Zone Gray 10	1. No blemish will be lighter than Microsoft Gray 10 in the Critical Zone 2. __ 2 blemishes in the Non-Critical Zone 3. No blemish will be > ½” long/diameter in the Non-Critical Zone

3	Reset boundary artifact	Gray 30	1. No reset boundary artifact will be visible on Microsoft Gray 30
4	Eyecatcher Border Artifacts	Gray 10	1. No Eyecatcher or border artifact will be lighter than Microsoft Gray 10 2. All Eyecatcher's and border artifacts ≥ 5 inches from the POM are acceptable
5	Streaks	Blue 60 Gray 10 White	1. No streaks
6	Projected Images	Any screen	1. No adjacent pixels 2. No bright pixels in Active Area 3. __ 1 bright pixel in the POM 4. __ 3 dark pixels 5. __ 6 minor blemishes 6. No DMD window aperture shadowing on the Active Area 7. No unstable pixels in Active Area

Notes:

1. Projected blemish numbers include the count for the shadow of the window artifact in addition to the artifact itself.

2. 3. 4. 5. 6.

No minor blemish shall be more than 5 inches long or have a total area of more than 5 square inches on a 60-inch diagonal projected image.

During all Table 1 tests, projected images shall be inspected in accordance with the conditions of inspection specified in Section 3.

The rejection basis for all cosmetic DMD defects (scratches, nicks, particles) will be the projected image tests referenced in Table 1.

Any other image quality issue not specifically defined in this document shall be acceptable.

Screens < Gray7 shall not be used as a basis for rejecting a DMD for image quality.

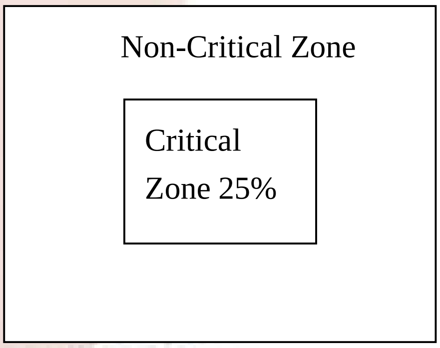


Figure 1. Major Blemish Two Zone Screen



Appendix E Electrical Specification

Content:

1. The Functions of MICOM

1.1 General function

1.1.1 Input Signals

Terminology In this Spec.	Input Signal Type (OSD Terminolgy)	Input Signal Format	Signal Path
PC	RGB	Analog RGB	D-Sub
YCbCr/YPbPr	HD	480i,480p, 720p,1080i	D-Sub
AV	Video	Composite	Video RCA (AV Interface Board)
	S-Video	Y/C	S-Video (A/V Interface Board)

1.1.2 Auto Detection of the Input Signal

- No signal detection : BLUE Background,
  - screen display : " (Input Signal Type)   No Signal "
  (fixed message position : center in the screen)
- Input Channel Auto Change : changes to the channel that input signal is detected.
- Detect the Change of Input Signal Format : If Input Signal Changes in Display Format, Blank the Screen Temporally
- Detect the not allowed V frequency : BLUE Background,   OSD
- PC Signal Format

	Resolution	Vertical Frequency	Horizontal Frequency
VGAEGA	640 x 350	70.090 Hz	31.468 kHz
	640 x 350	85.080 Hz	37.861 kHz
PC98	640 x 400	85.080 Hz	37.861 kHz
	720 x 400	70.082 Hz	31.469 kHz
	720 x 400	85.039 Hz	37.927 kHz
VGA	640 x 480	59.940 Hz	31.469 kHz
	640 x 480	66.667 Hz	35.00 kHz
	640 x 480	72.800 Hz	37.861 kHz
	640 x 480	75.00 Hz	37.500 kHz
	640 x 480	85.008 Hz	43.269 kHz
	640 x 480	100.040 Hz	53.011 kHz
SVGA	800 x 600	56.250 Hz	35.156 kHz
	800 x 600	60.317 Hz	37.879 kHz
	800 x 600	72.188 Hz	48.077 kHz
	800 x 600	75.00 Hz	46.875 kHz
	800 x 600	85.061 Hz	53.674 kHz
	800 x 600	90.00 Hz	56.00 kHz
	800 x 600	100.00 Hz	64.016 kHz

XGA		1024 x 768	43.479 Hz	35.522 kHz
		1024 x 768	60.004 Hz	48.363 kHz
		1024 x 768	70.069 Hz	56.476 kHz
		1024 x 768	75.029 Hz	60.023 kHz
		1024 x 768	84.997 Hz	68.677 kHz
SXGA		1152 x 864	60.053 Hz	54.348 kHz
		1152 x 864	70.016 Hz	63.995 kHz
		1152 x 864	75.00 Hz	67.500 kHz
		1152 x 864	85.057 Hz	77.487 kHz
SXGA		1280 x 960	60.00 Hz	60.00 kHz
		1280 x 960	75.00 Hz	75.00 kHz
		1280 x 1024	43.436 Hz	46.433 kHz
		1280 x 1024	60.020 Hz	63.981 kHz
		1280 x 1024	75.025 Hz	79.976 kHz
MAC	16"	832 x 624	74.550 Hz	49.725 kHz
	19"	1024 x 768	60.004 Hz	48.363 kHz
		1024 x 768	75.029 Hz	60.023 kHz
	21"	1152 x 870	75.062 Hz	68.681 kHz

- HD Signal: 480i, 480p, 720p, 1080i
- A/V(Video/S-Video) Signal: NTSC / PAL / SECAM / NTSC4.43 / PAL M / PAL N

1.1.3 Image Scaling Up/Down (OSD; GUI)

- RESIZE (Full Screen & Original Size Modes)

1.1.7 Other Functions

- Flip Vertical/ Flip Horizontal
- BLANK Mode Output Image Selection: Black, Green, Blue or LG Logo
- LAMP TIME : display or initialize the lamp time.
- Language : selects OSD Language, according to MRS
- KEYSTONE : V Keystone correction
- Screen LOGO : displays the LG logo image for blanking the screen when system starts

1.2 System Control Functions

1.2.1 POWER CONTROL

- POWER ON → FAN ON → LAMP ON → LG Logo ON → Auto Image
- POWER OFF → LAMP OFF → FAN OFF → MAIN POWER OFF

1.2.2 LED's color Definition

- 3 colors LED (Red/Green/Orange)

State	LEDs Display		Description	Screen	Warinng OSD
	Operation LED	Status LED			
Stand-by			Orange : Orange Toggle : Red : Red Toggle : Green : OFF state :	OFF	OFF
Ready (Power On)			Blinks Operation LED For 30 seconds	OFF	OFF
Normal			Normal State	ON	OFF
Lamp On Error			Check whether the Lamp is lit or not.	OFF	OFF
Lamp Time over Error			Lamp Time < 1400 hours (Normal State)	ON	OFF
			1400 hours < Lamp Time < 1500 hours	ON	OFF
			Lamp Time > 1500 hours	ON	ON

*You can change Temperature range according to your temperature condition.

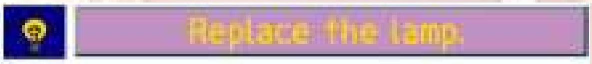
1.2.2.1 Lamp On Error state

- If Lamp is not lit normally, display the LEDs above , you have to turn the projector off.

1.2.2.2 Lamp Time over Error state

- Lamp Time Display : On OSD Menu
- Case 1: 1400 hours < Lamp Time < 1500 hours
  - Display the Lamp Time over Error LEDs above.

- Case 2: Over 1500 hours
  - OSD Position : the left corner of the screen.



- Lamp Time Initialization : After replacing the lamp, press the Remote Keys in the order as bellows

Order : Fn. Up → Fn. Down → Volume Down → Volume Up → Enter → Power

1.2.2.3 Temperature Error state

1.2.2.5 Fan On Error state

- If Fan is not operated normally, displays Fan On Error LEDs & Display Fan on Error OSD..



1.2.2.6 Lamp Case_Open state

- If Lamp case is opened abnormally or when you replace used lamp with a new one, it displays lamp case_open LEDs .

1.2.3 WIRELESS MOUSE CONTROL

- 16 Direction, Left/Right Click, Drag
- Supports USB mouse
- we use Remocon joystick to control both Mouse point and OSD menu.
- When user controls the OSD menu, Mouse function should temporally be disabled.

1.2.4 DDC 2BI

- 24LC21 : System MICOM does not control this device.

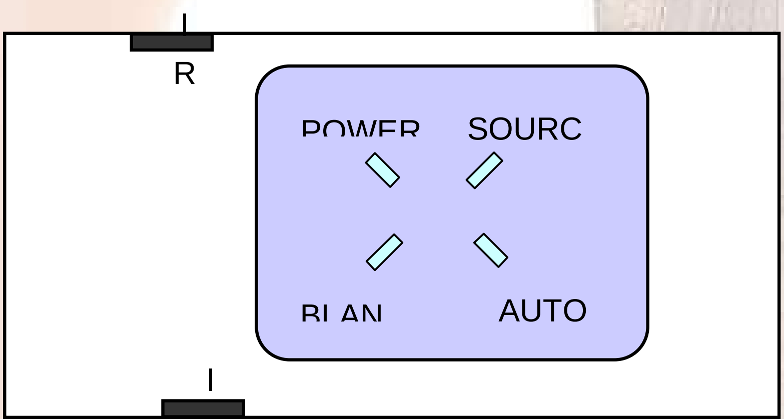
1.2.5 DATA STORAGE

- EEPROM(24C16, 16kBit), IICBUS

2. User Interface : Key Service

2.1 Local Keys

Key / Port (PW166B)	Local KEY
Port B0	Source (Key_In0)
Port B1	Auto (Key_In1)
Port B2	Blank (Key_In2)
Port B3	Power (Key_In3)



- Local Key Position

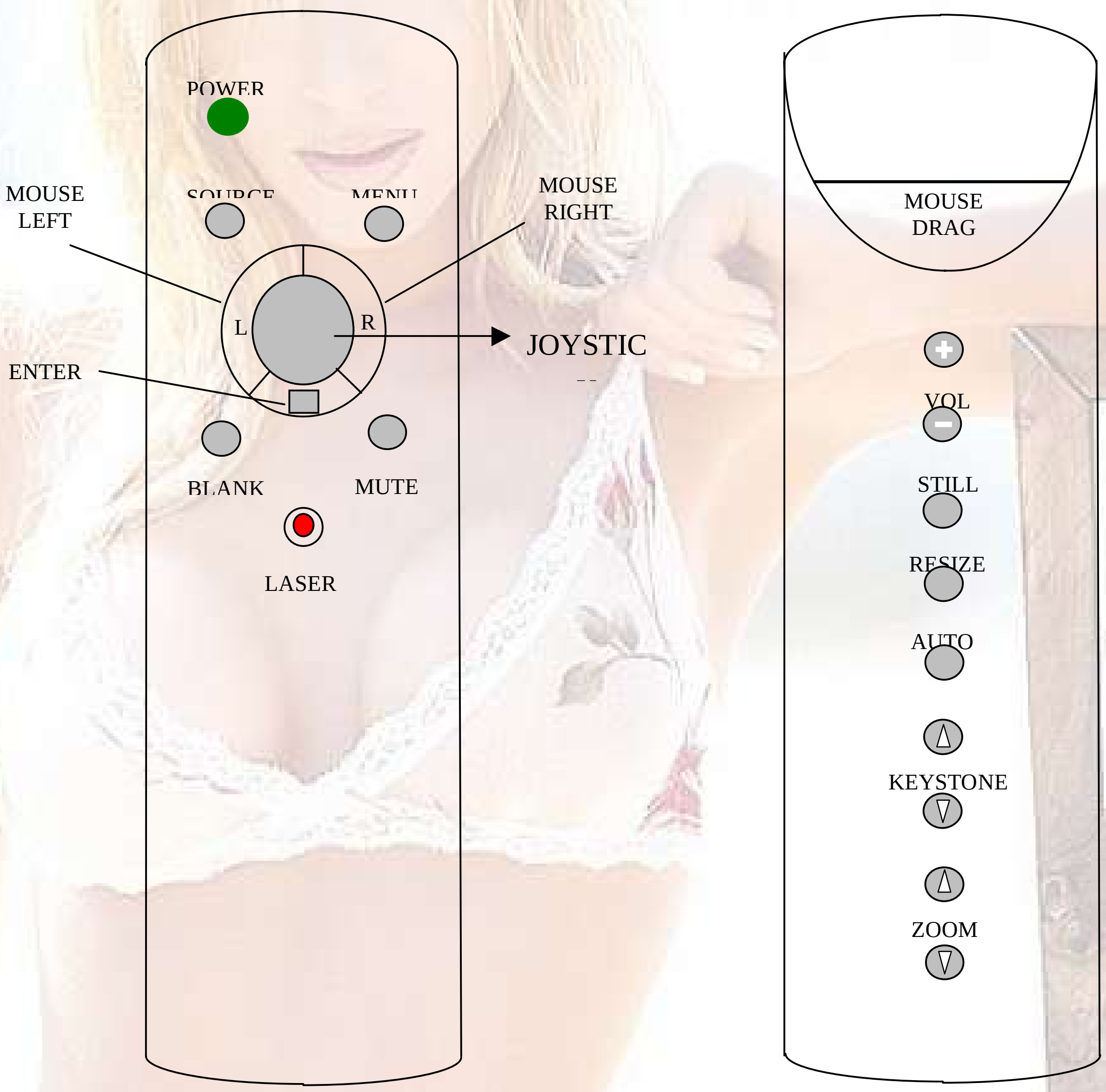
2.2 Remocon Key

2.2.1 Remocon Key Code & Structure

2.2.1.1 Remocon key code

KEYS		
No	Function	Code
1	POWER	$AD
2	SOURCE	$0B
3	MENU	$43
4	MOUSE LEFT CLICK	$07
5	MOUSE RIGHT CLICK	$06
6	MOUSE DRAG	$AE
7	ENTER	$44
8	BLANK	$84
9	STILL	$BC
10	RESIZE	$79
11	MUTE	$09
12	VOLUME UP	$02
13	VOLUME DOWN	$03
14	AUTOTRACKING	$92
15	ZOOM UP	$40
16	ZOOM DOWN	$41
17	KEYSTONE UP	$A4
18	KEYSTONE DOWN	$A5

2.2.1.2 Remocon Structure

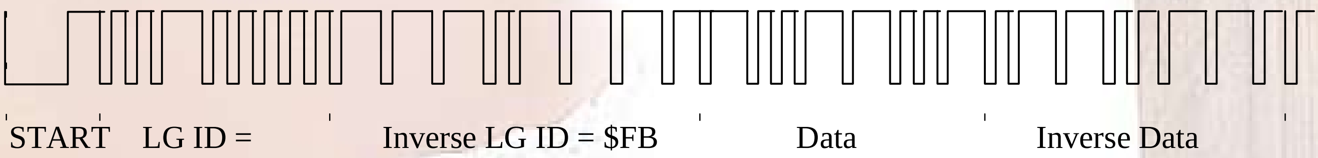


[Front]   [Rear]

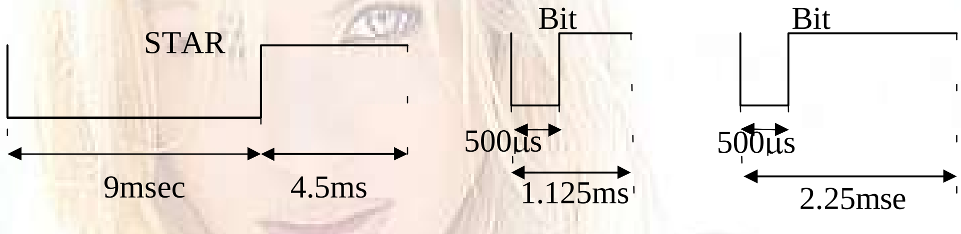
2.2.2 REMOCON & JOYSTICK IR Signal wave form

2.2.2.1 Remocon waveform : NEC format

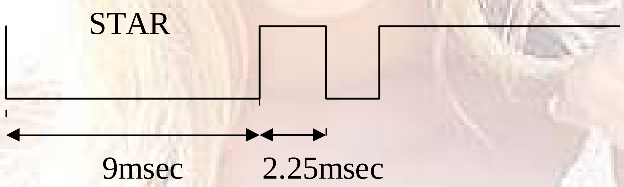
2.2.2.1.1 Configuration of Flame



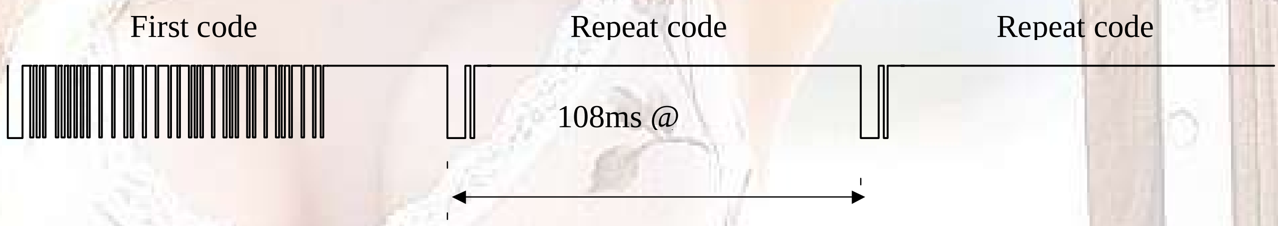
2.2.2.1.2 Bit Description



2.2.2.1.3 Repeat code

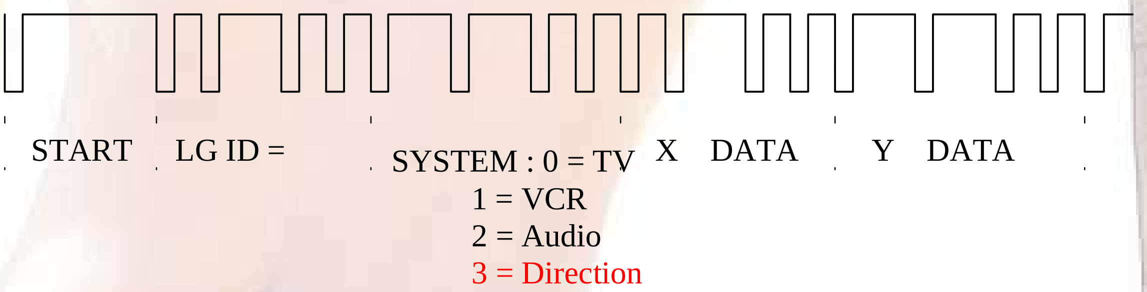


2.2.2.1.4 Flame interval

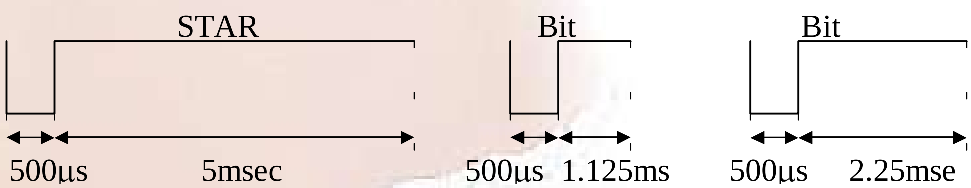


2.2.2.2 Joystick waveform & directional pointing data

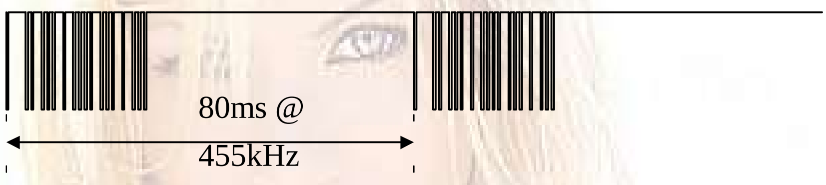
2.2.2.2.1 Configuration of Flame



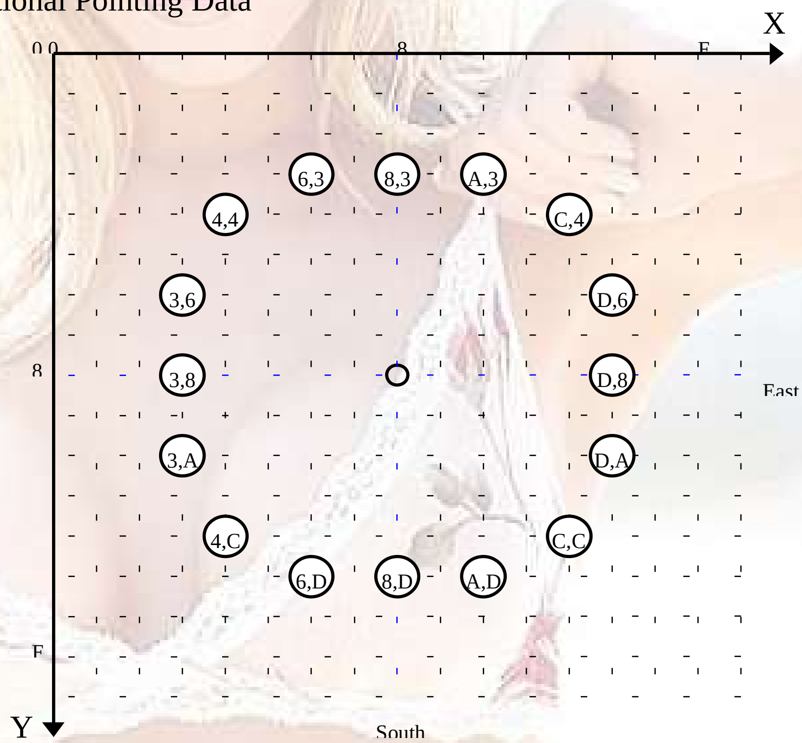
2.2.2.2.2 Bit Description



2.2.2.2.3 Flame interval



2.2.2.2.4 Directional Pointing Data



2.2.2.2.4.1 Mouse Pointer

- When we control Mouse Pointer, we use all 16 directions code differently.
- But when we control Menu OSD, we only use 4 directions like below.

Key code	function
(6.3), (8,3), (A,3)	Function Up
(6,D), (8,D), (A,D)	Function Down
(3,6), (3,8), (3,A)	Volume Down
(D,6), (D,8), (D,A)	Volume Up
(4,4), (C,4), (4,C), (C,C)	Ignore

2.2.3 Operating ranges of the Keys

keys	Stand By	Service	Repeat	Menu On	No OSD	No Sync	GUI Builder State(SDK1.9)
POWER							

2.3.2 SOURCE Key (Local & Remocon)

- Be set in the last selected mode when projector is turned on.
- Source change order

  Case 1 : A/V Board connected.

  : RGB → HD → Video → S-Video → RGB

2.3.3 Menu Key

- Main Menu On/Off
- be able to clear MENU OSD by pressing Menu key in the first step of MENU OSD.
- adjust items or select items by Volume +/ -, JOYSTICK
- be able to enter the lower level of menu by pressing Volume (-) key or pushing JOYSTICK right
- OSD Time : Until being cleared.

2.3.3.1 VIDEO Menu

- selected by pressing Volume + key or pushing JOYSTICK right on the position of VIDEO Menu
- be able to enter the lower level of menu by pressing Volume (+) key or pushing JOYSTICK right
- Volume +/ - key : move to lower level of Menu or CANCEL
- JOYSTICK : select items (move Cursor) or adjust items (in lower level of menu)
- Enter Key : Save & Return
- Be set in the last selected mode when projector is turned on.
- Different MENU between RGB(PC) and AV(Video /S-Video)

case : RGB (PC)

VIDEO menu	Range
Contrast	0 ~ 100
Brightness	0 ~ 100
Color R	0 ~ 100
Color G	0 ~ 100
Color B	0 ~ 100
Reset	Press Enter to Reset

case : AV (VIDEO / S-VIDEO) / HD

VIDEO menu	Range
Contrast	0 ~ 100
Brightness	0 ~ 100
Color	0 ~ 100
Tint	-50 ~ +50
Reset	Press Enter to Reset

- Video sub-menu OSD Display time : Until being cleared.

2.3.3.2 POSITION Menu

- selected by pressing Volume (+) key or pushing JOYSTICK right on the position of POSITION Menu
- be able to enter the lower level of menu by pressing Volume + key or pushing JOYSTICK right
- Volume +/ - key : move to lower level of Menu or CANCEL
- JOYSTICK : select items (move Cursor) or adjust items (in lower level of menu)
- Enter key : Save & Return
- Be set in the last selected mode when projector is turned on.
- Different MENU between RGB and AV / HD

POSITION MENU	Range	
Horizontal	-50 ~ +50	(shift the screen horizontally.) (only PC / HD)
Vertical	-50 ~ +50	(shift the screen vertically.) (only PC / HD)
Keystone	-50 ~ +50	
Zoom	Press Enter to Start	
Resize	Scaled / Original	(PC)
	4:3 / 16:9	(HD / Video / S-Video)

- Scaled : only in the smaller modes than XGA (1204X768)
- Original : real size
- Position sub menu OSD Display Time : Until being cleared.

2.3.3.3 SPECIAL Menu

- selected by pressing Volume (+) key or pushing JOYSTICK right on the position of SPECIAL
- be able to enter the lower level of menu by pressing Volume (+) key or pushing JOYSTICK right

- Volume +/ - key : move to lower level of Menu or CANCEL
- JOYSTICK : select items (move Cursor) or adjust items (in lower level of menu)
- Enter key : Save & Return
- Be set in the last selected mode when projector is turned on.
- Different MENU between RGB and AV

SPECIAL Menu	Selection
Language	According to MRS
Flip Vertical	Press Enter to Flip
Flip Horizontal	Press Enter to Flip
Blank Image	Black / Blue / Green / Logo
Lamp Time	0 Hour
VGA Text	640 × 400 / 720 × 400 (only PC)

- manually control 640 × 400 or 720 × 400 mode because two mode is very similar sync and it is not easy to discriminate them.
- Special sub-menu OSD Display Time : Until being cleared.

2.3.3.4 TRACKING Menu

- Volume +/ - key : move to lower level of Menu or CANCEL
- JOYSTICK : select items (move Cursor) or adjust items (in lower level of menu)
- Enter Key : Save & Return

TRACKING menu	Range	
Auto Tracking	Press Enter to Start (only PC)	
Clock	0 ~ 50	(manual clock adjusting) (only PC)
Phase	0 ~ 50	(manual phase adjusting)(only PC)

- Tracking sub-menu OSD Time : Until being cleared.

2.3.4 – 5 Mouse Left / Right Key

- Operates as a mouse left/right click button when remote mouse function is used.
- But mouse drag function is implemented by other drag on/off toggle key in remote controller.
- Operate as a zoom up/down key when zoom function is operating.

2.3.6 Mouse Drag Key

- Operates as a mouse drag on/off toggle key when remote mouse function is used.
- Once drag toggle key is pressed, moving joystick operates as mouse drag function.
- Drag function can be released by toggling the key

2.3.7 ENTER Key

- display the present source & mode
- Enter OSD Display Time : 5 seconds.
- Save & Return.

2.3.8 Blank Key (Local & Remocon)

- VIDEO Mute On/Off Toggle key.
- Make the screen entirely blue for blanking the input video.
- When blank function is canceled, screen goes back to input video.

2.3.9 Still Key

- Still function On / Off
- Still function is to make the screen still.

2.3.10 Resize Key

- Resize On/Off Toggle key.
- It selects scaled video output up to SVGA resolution or original input size video output.
- This function is allowed when input video resolution is lower than SVGA(800x600).
  (only PC : Scaled / Original)
  - HD / Video / S-Video : 4 : 3 / 16 : 9

2.3.14 Auto Tracking Key (Local & Remote)
- Only PC source.
- Auto Tracking function can be executed by Auto Tracking Key in remote controller.
  And it makes screen look good and takes several seconds.
- Auto Tracking item in OSD menu
- Auto Tracking does following sub functions
  1. Auto Positioning : Adjusting screen position automatically.
  2. Auto Clock & Phase Adjustment : Adjust PLL Clock and Phase value automatically.

2.3.15-16 Zoom Up/Down Key

- Zoom: 25 steps
- Zooming up/down by Zoom Up/Down KEY
- Scrolling by Joystick
- Zoom OSD Display Time : 5 seconds.

2.3.18 JOYSTICK

- Mouse 16 directions,   Volume + / -
- Moves cursor or adjusts selected item value when OSD menu is on.
- Scrolls the screen when zoom function is on.
- Moves mouse pointer when it used as a mouse key.

Appendix F Power Supply Specification

F.1 Input Power Specification

Specification	Description
Input Voltage Range	The unit shall meet all the operating requirements with the range 90 ~ 264 VAC
Frequency Range	The unit shall meet all the operating requirements with an input frequency range 47 ~ 63 Hz
Power Consumption	Normal operation: 240 W max. standby mode: 15W max.
Regulation Efficiency	80 % (typical) measuring at 115Vac and full load

F.2 Output Power Requirement

Chapter 2 Spare Parts List

LG Projector RD-JT3199.J5577.L31

NO	PART NO	DESCRIPTION
1	35.80J49.041	LENS ROD 4.8X3.45 JT30 KEOC
2	55.J4906.001	PCBA CHIP/BD LG JT30
3	60.J4909.001	ASSY COLOR DRUM MODULE JT30
4	55.J4922.001	PCBA SENSOR/BD LG JT30
5	60.J4910.001	ASSY LENS C1,C2 JT30 PROT
6	60.J4911.001	ASSY FOLD MIRROR MODULE JT30
7	60.J4912.CG1	ASSY CSD RD-JT30 LAMP MODULE
8	65.J4901.011	PROJECTION LENS ZOOM JT31 CO
9	54.J4913.001	KEYPAD BD/JT30
10	55.J4905.001	PCBA DC-DC/BD LG JT30
11	55.J4908.001	PCBA IR/BD LG JT30
12	55.J4911.001	PCBA PFC/BD LG JT30
13	55.J5501.001	PCBA MAIN/BD JT31
14	60.J4901.011	ASSY FRONT DOOR JT31
15	54.J4912.001	BALLAST PHG151G14 USHIO JT30
16	23.10094.001	FAN DC 12V35*35*7.5 AB3512HB-
17	60.J4919.001	ASSY FAN MODULE JT30
18	60.J4905.011	ASSY UPPER CASE JT31
19	60.J4906.001	ASSY REAR COVER JT30
20	60.J4907.001	ASSY LOWER CASE JT30
21	60.J4908.001	ASSY LAMP DOOR JT30
22	23.10095.001	FAN 12V 45*45*10 AD4512HB-G76
23	42.06639.001	BAG PE 450*310*0.04 5535
24	44.J0502.181	CTN 415X325X255 LG JT30
25	47.J4908.001	CSN RIGHT JT30
26	60.J5501.001	ASSY MANUAL + QS JT31
27	27.01218.191	CORD H03VV-F3G(MI) 2500MM CEE
28	27.02718.201	CORD H05VV-F(MI) 10A250V2500U
29	27.04318.031	CORD VCTF3G(MI)7A125V 1800 T-
30	50.73213.501	CABLE 4P USB A-B 1800MM BLACK
31	50.J2403.501	SIGNAL/C 15/15P (-9) 2500MM
32	50.J7111.501	CABLE A/V (G.B.R)1800 BLK 784
33	60.J5578.001	ASSY CABLE RCA+S-VIDEO
34	98.J5501.001	REMOTE CONTROLLER LG 6710V008
35	98.J1302.041	SOFT CASE SL705X LG

LG Projector RD-JT30   99.J4977.L31

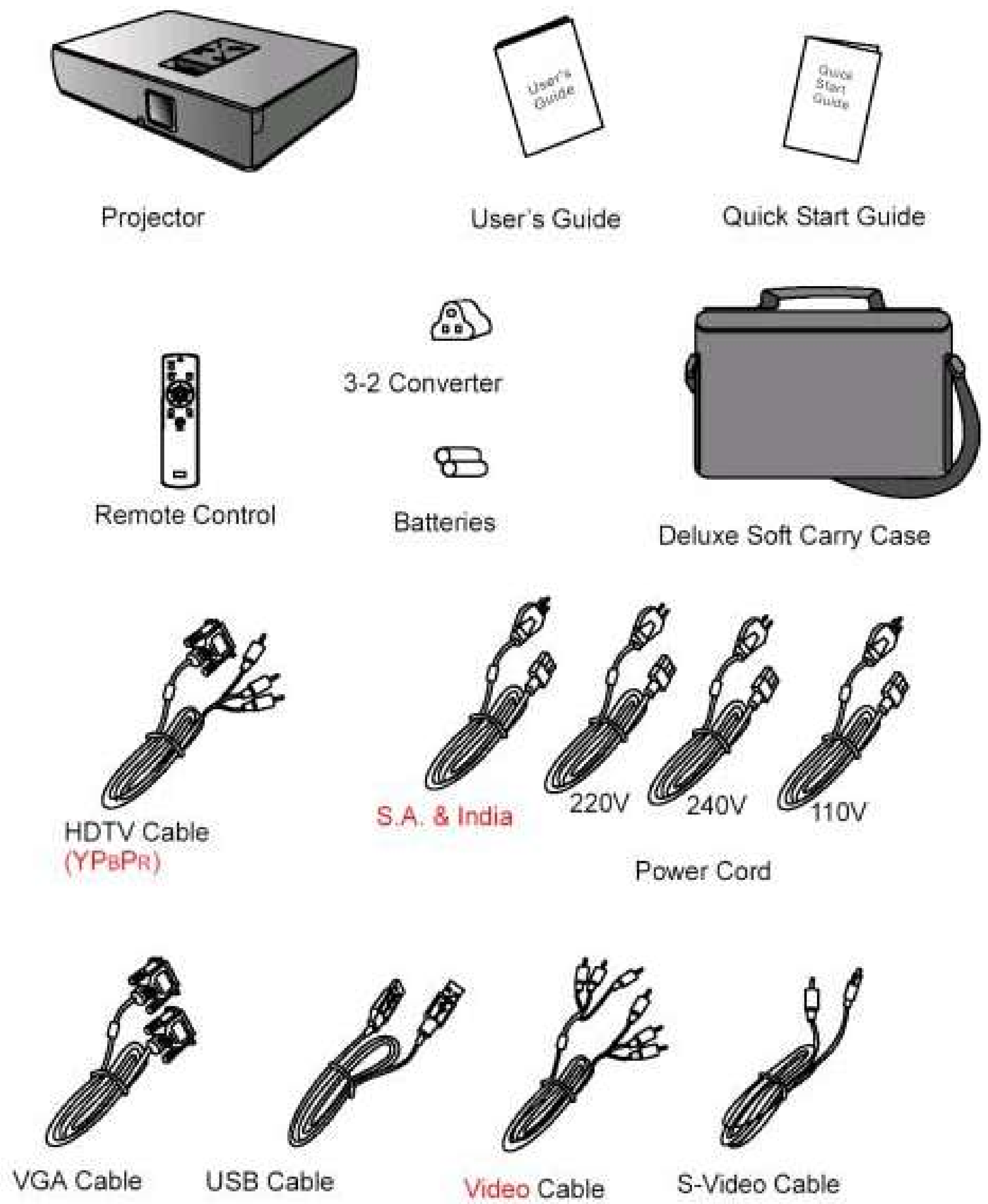
NO	PART NO	DESCRIPTION
1	35.80J49.091	LENS ROD 6.1X4.4X40 JT30
2	55.J4906.001	PCBA CHIP/BD LG JT30
3	60.J4911.001	ASSY FOLD MIRROR MODULE JT30
4	35.81J49.001	Glass front UVAR JT30 PROT
5	55.J4922.001	PCBA SENSOR/BD LG JT30
6	65.J4905.011	COLOR DRUM 35MM 90DEG JT30
7	65.J4901.011	PROJECTION LENS ZOOM JT31 CO
8	65.J4903.001	ASSY TIR RPISM JT30 THALES
9	71.07XGA.B00	IC DMD 0.7XGA DDR 12
10	50.J4901.001	WIRE 8/8P 1007#24 60MM
11	50.J4902.001	WIRE 4/3P 1571 #28 140MM
12	50.J4903.001	WIRE 3/3P 1571 #28 60MM
13	50.J4904.001	WIRE 3/4P 1571 #28 60MM
14	50.J4905.001	ASSY SW+WIRE 155MM
15	50.J4906.001	ASSY SW+WIRE 60MM
16	50.J4907.001	WIRE 5/5P 1571 #28 73MM
17	50.J4908.001	WIRE 3/3P(-1) 1015 #24 185MM
18	54.J4913.001	KEYPAD BD/JT30
19	55.J4901.001	PCBA MAIN/BD LG JT30
20	55.J4905.001	PCBA DC-DC/BD LG JT30
21	55.J4911.001	PCBA PFC/BD LG JT30
22	55.J4924.001	PCBA REAR IR/BD JT30
23	60.J4901.001	ASSY FRONT DOOR JT30
24	54.J4912.001	BALLAST PHG151G14 USHIO JT30
25	55.J4908.001	PCBA IR/BD LG JT30
26	23.10094.001	FAN DC 12V35*35*7.5 AB3512HB-
27	23.10096.001	FAN DC12V 50*50*20 AFB0512HD
28	60.J4905.001	ASSY UPPER CASE JT30
29	60.J4906.001	ASSY REAR COVER JT30
30	60.J4907.001	ASSY LOWER CASE JT30
31	60.J4908.001	ASSY LAMP DOOR JT30
32	23.10095.001	FAN 12V 45*45*10 AD4512HB-G76
33	42.06639.001	BAG PE 450*310*0.04 5535
34	44.J0502.181	CTN 415X325X255 LG JT30
35	47.J4908.001	CSN RIGHT JT30

36	49.J5501.001	MANUAL USER LG JT31/30
37	49.J5502.001	QUICK START GUIDE LG JT31/30
38	27.01218.191	CORD H03VV-F3G(MI) 2500MM CEE
39	27.01418.011	CORD H05VV-F(MI*3)6A250V S-AF
40	27.02718.201	CORD H05VV-F(MI) 10A250V2500U
41	27.04318.031	CORD VCTF3G(MI)7A125V 1800 T-
42	50.73213.501	CABLE 4P USB A-B 1800MM BLACK
43	50.J2401.001	CABLE D-SUB/RCA 1800MM/SL705X
44	50.J2403.501	SIGNAL/C 15/15P (-9) 2500MM
45	50.72918.001	CABLE A/V RCA(R,W,Y)1500MM
46	50.72920.011	C.A MIN-DIN 4P S-VIDEO W/S 15
47	98.J5501.001	REMOTE CONTROLLER LG 6710V008
48	98.J1302.041	SOFT CASE SL705X LG

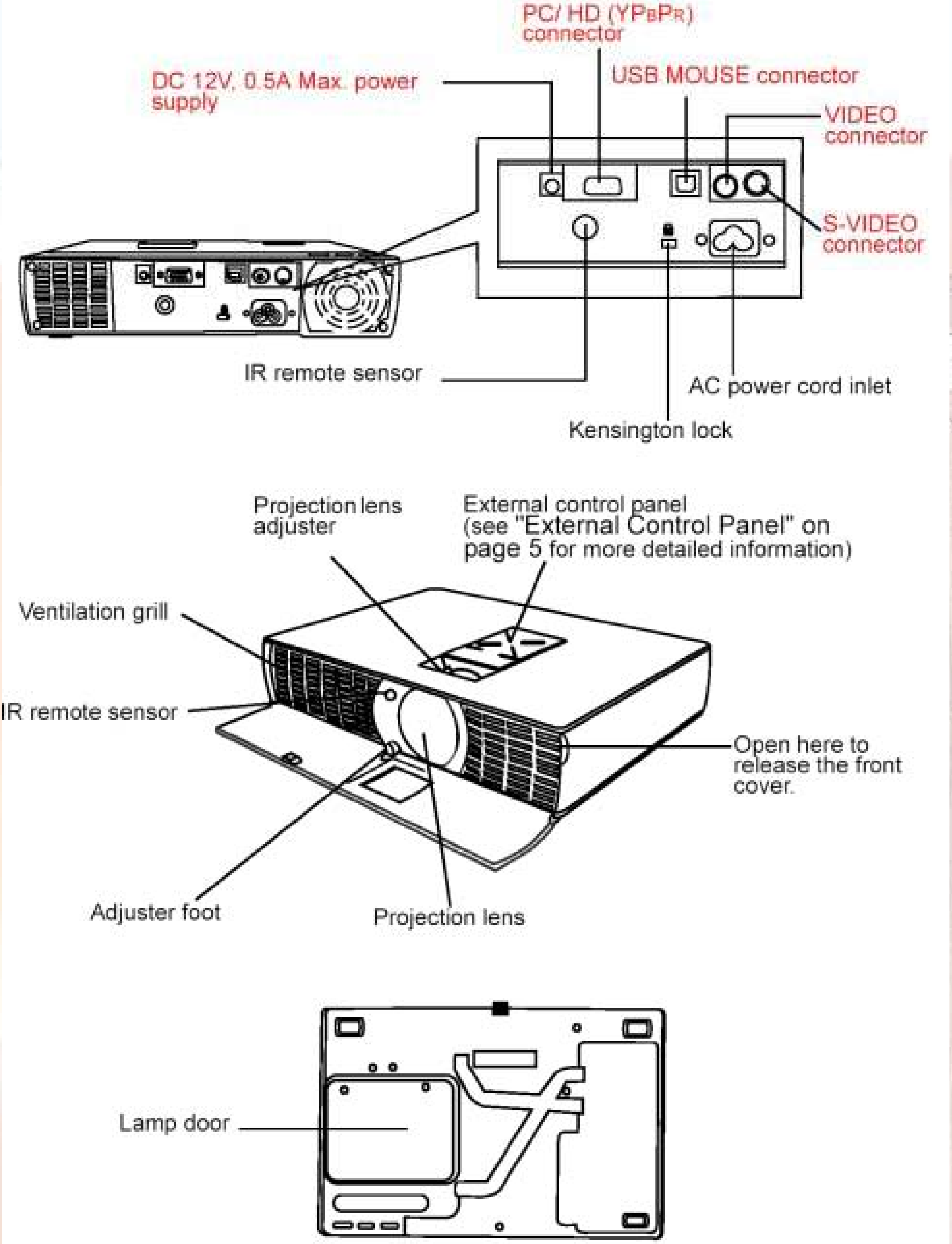
Chapter 3 Production Description and operation

1. **Shipping Content**

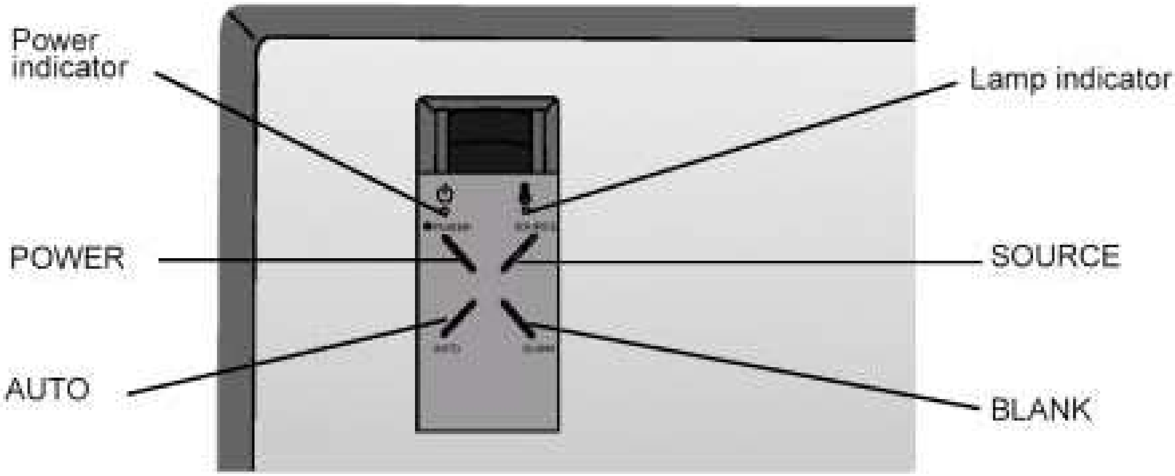
The Projector is shipped with the cables required for connection to standard PC or laptop computers. Carefully unpack and verify that you have all the items shown below. If any of these items are missing, please contact personnel at the place of purchase.



2. Product Description



External Control Panel



Power indicator

The indicator shows green for a normal state. When the projector is operated improperly, it shows green or orange toggle. See "Operative Information" on page 21 for more detailed information.

POWER

Press the **POWER** key to turn the projector on or off.

AUTO

Automatically determines the best picture settings for current received signals. (PC Mode Only)

Lamp Indicator

The Lamp Indicator will light up when the lamp needs service, cooling or replacement. See "Lamp Information" on page 20 for more detailed information.

SOURCE

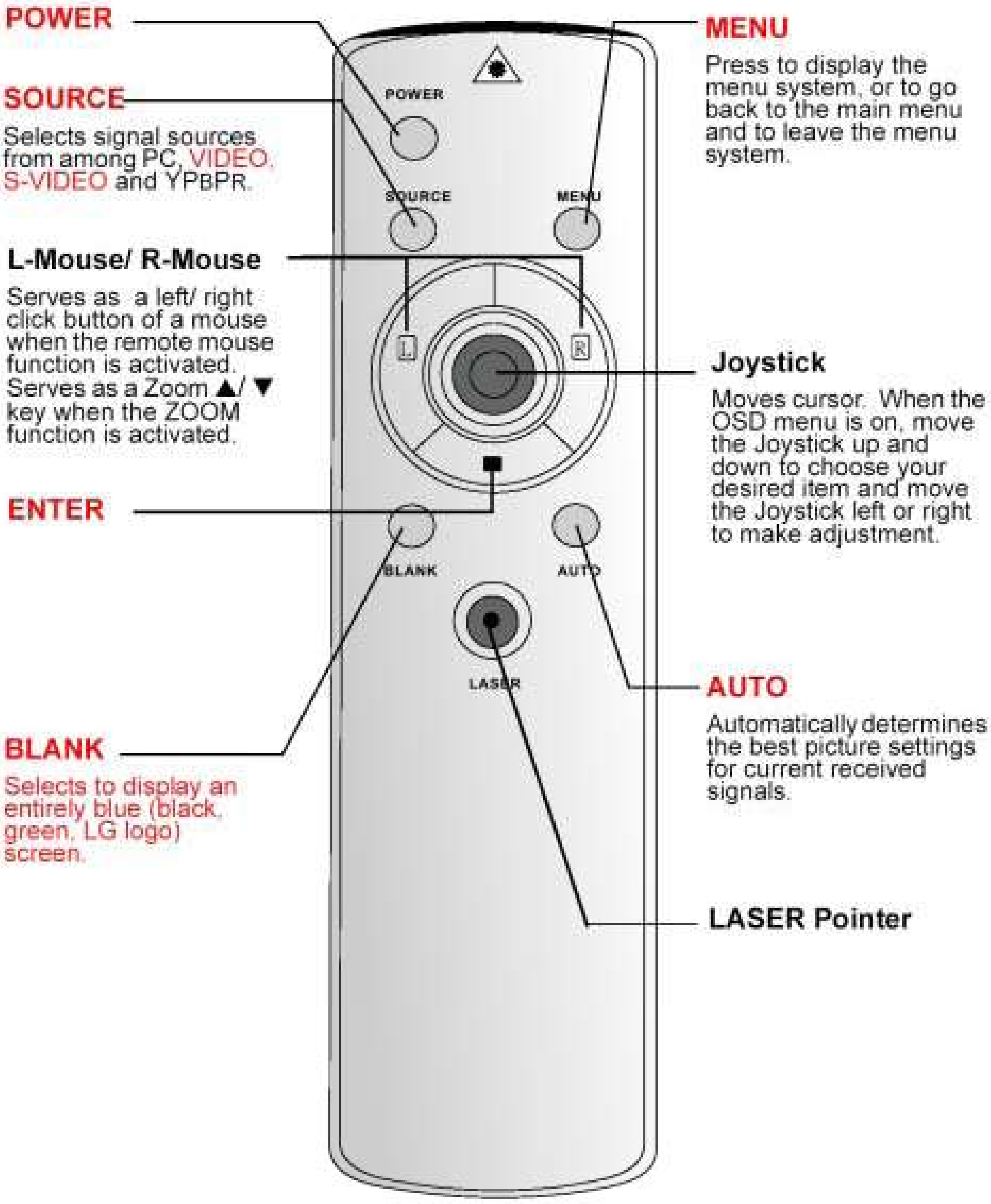
Selects signal sources from among PC, Video, S-Video and YPBPR.

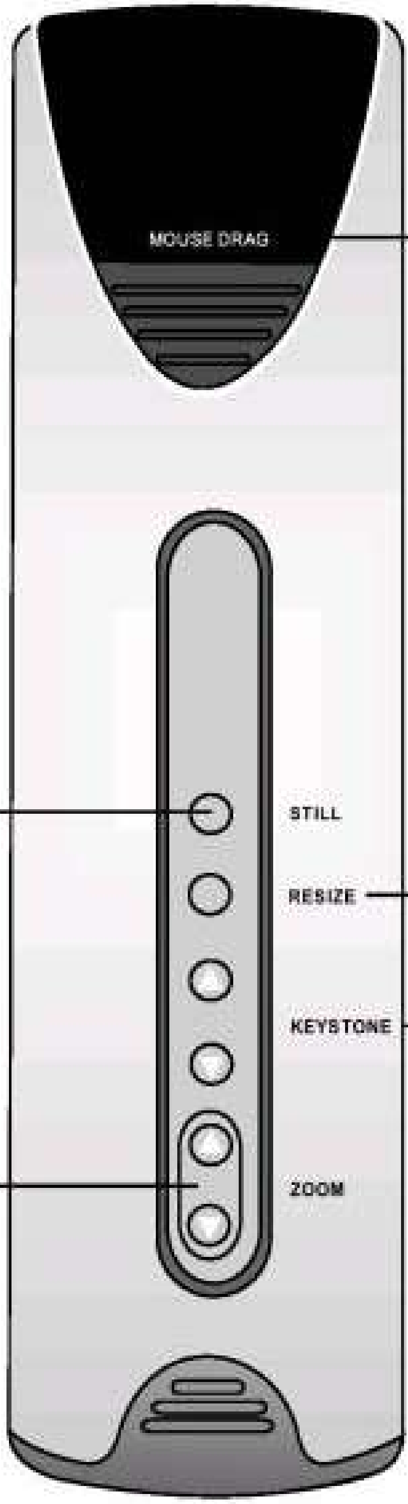
BLANK

Selects to display an entirely blue, black, green or LG logo screen.

3. Remote Control Description

The remote control sensors are located in the front/ back of the projector.





MOUSE DRAG

When the remote control works as a mouse, choose your desired item and press MOUSE DRAG. Drag it to wherever you want on the projection image and press MOUSE LEFT to release the item.

STILL

Makes the projection image still.

RESIZE

Scales the original input resolution.

KEYSTONE ▲ ▼

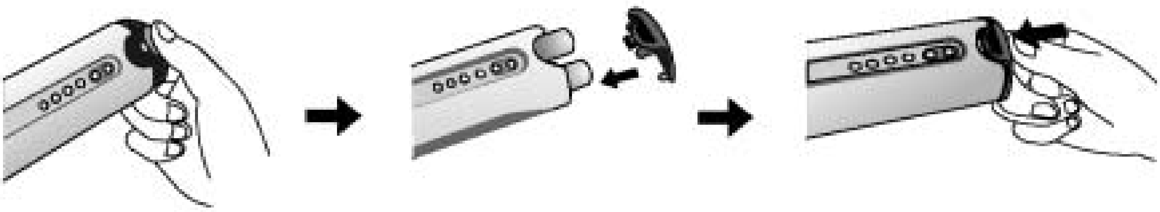
Refer to "Digital Keystone Correction" on page 13.

ZOOM

By pressing ZOOM, the center of the picture will be magnified. When the ▲ button is pressed again, the picture is further magnified. By pressing ▼, the size of the image is reduced. If you want to browse other part of the picture, you can use Joystick to scroll.

Installing or Replacing Batteries

1. Press and open the battery compartment lid in the direction.
2. Install batteries as indicated by the diagram inside the compartment.
3. Position the lid over the compartment and snap it back into place.

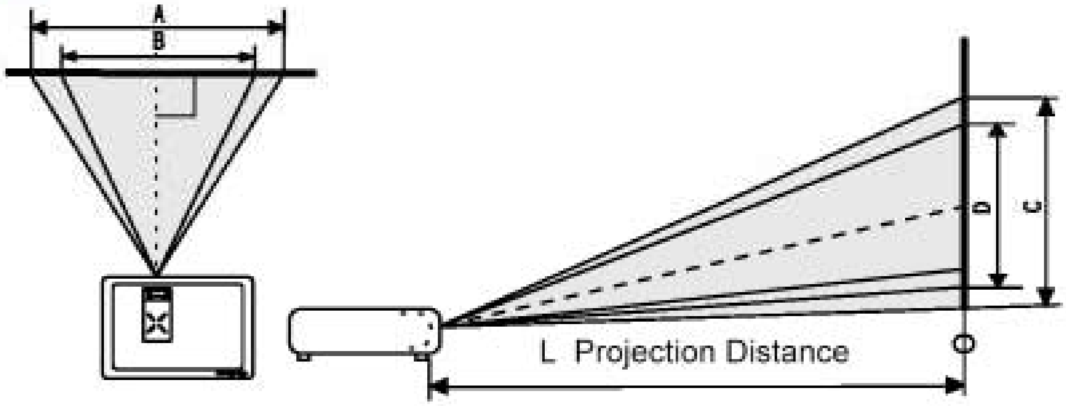


⚠ Caution

Avoid excessive heat and humidity. There may be danger of an explosion if batteries are incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Display Size

Place the projector at the required distance from the screen according to the desired picture size (see the table below). The effective display size is from 26 to 178 inches diagonally for RD-JT31 and from 33 to 228 inches diagonally for RD-JT30.



- RD-JT31 display size chart

Display Size (Max.)			L. Projection Distance (cm)	Display Size (Min.)		
Diagonal (in)	A. Width (cm)	C. Height (cm)		Diagonal (in)	B. Width (cm)	D. Height (cm)
33.4	67.9	50.9	150	25.7	52.2	39.2
44.5	90.5	67.9	200	34.3	69.6	52.2
66.8	135.7	101.8	300	51.4	104.4	78.3
89.1	181.0	135.7	400	68.5	139.2	104.4
111.3	226.2	169.7	500	85.6	174.0	130.5
133.6	271.5	203.6	600	102.8	208.8	156.6
155.9	316.7	237.5	700	119.9	243.6	182.7
178.1	362.0	271.5	800	137.0	278.4	208.8

- RD-JT30 display size chart

Display Size (Max.)			L. Projection Distance (cm)	Display Size (Min.)		
Diagonal (in)	A. Width (cm)	C. Height (cm)		Diagonal (in)	B. Width (cm)	D. Height (cm)
42.8	86.9	65.2	150	32.9	66.8	50.1
57.0	115.8	86.9	200	43.8	89.1	66.8
85.5	173.7	130.3	300	65.8	133.6	100.2
114.0	231.6	173.7	400	87.7	178.2	133.6
142.5	289.6	217.2	500	109.6	222.7	167.1
171.0	347.5	260.6	600	131.5	267.3	200.5
199.5	405.4	304.0	700	153.5	311.8	233.9
228.0	463.3	347.5	800	175.4	356.4	267.3

Connecting to Various Equipment

HDTV description

The projector is capable of displaying various High Definition TV display modes. Some of these sources are:

- Digital-VHS (D-VHS) player
- DVD player
- Satellite Dish HDTV receiver
- DTV tuners

Most of these sources will provide an analog component video output, a standard VGA output, or a YPBPR (default) format.

The projector is capable of accepting HDTV data through a YPBPR connector. Use a HDTV cable that came with your projector to display HDTV images.

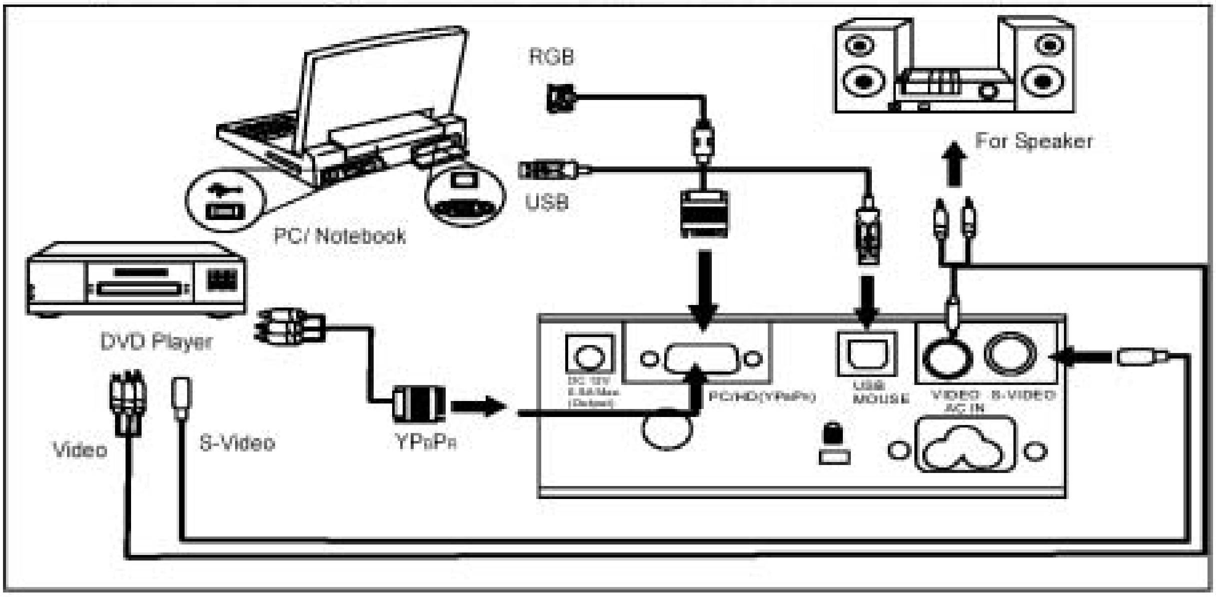
The following standards are supported in the HDTV function:

- 480i
- 480p
- 720p
- 1080i

Please refer to "Menu System" on page 14 for information on the HDTV (YPBPR) OSD selections.

Connecting to Various Equipment

It only takes a few seconds to connect your projector to your desktop or notebook computer, VCR, or other systems. However, a Mac adapter (an optional accessory) is needed for connection to Macintosh computers.



5. **Operation**

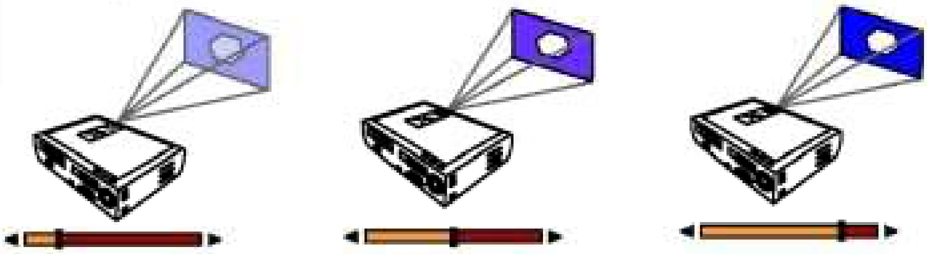
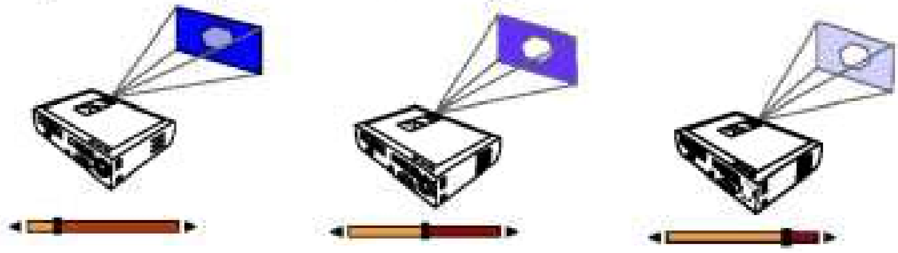
A. **User OSD**

Menu System

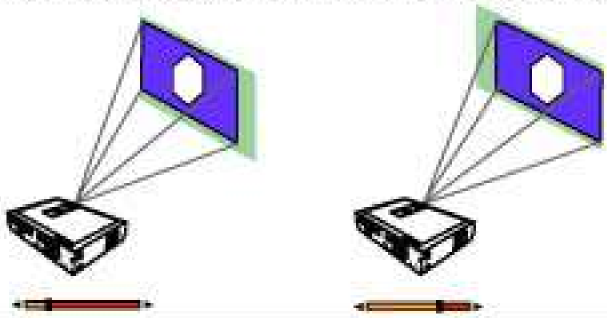
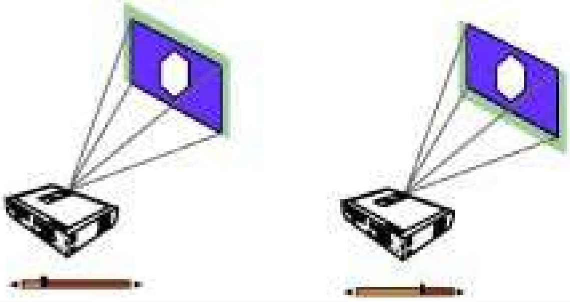
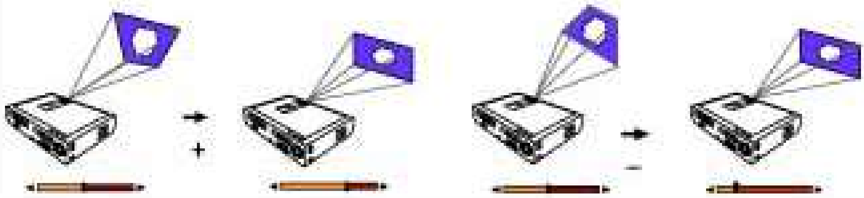
Press **Menu** for the main menu, and then press Joystick to select a sub-menu.
Press **ENTER** again to select items in the sub-menu.

	Main Menu	VIDEO	POSITION	SPECIAL	TRACKING
Sub-Menu	**YPBPR Video S-Video**	Contrast Brightness Color Tint Reset	~~Horizontal~~ ~~Vertical~~ Keystone Zoom Resize	Source Language Flip Horizontal Flip Vertical Blank Image Lamp Time	
	PC (RGB)	Contrast Brightness Color R Color G Color B Reset	Horizontal Vertical Keystone Zoom Resize	Source Language Flip Horizontal Flip Vertical Blank Image Lamp Time ~~VGA Text~~	Auto Tracking Clock Phase

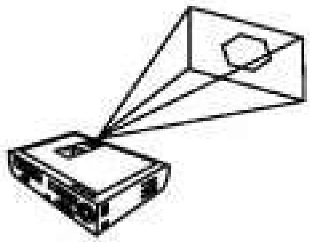
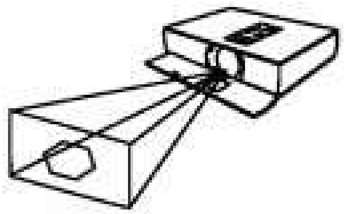
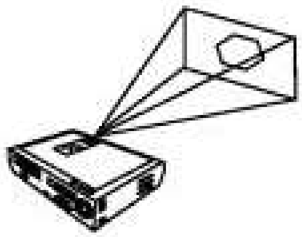
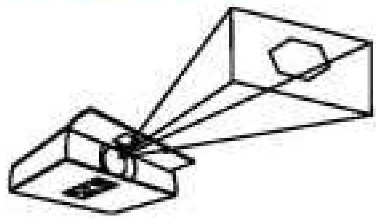
1. VIDEO Menu

FUNCTION	DESCRIPTION
Contrast	Adjusts the degree of difference between dark and light in the image. 
Brightness	Adjusts the brightness of the image. 
Color	Increases or decreases the color range of the image. ***This function is not available when the input mode is PC.***
Tint	Adjusts the image to make it appear more red or green. ***This function is not available when the input mode is PC or PAL signal.***
Color R **Color G** **Color B**	Increases or decreases the color temperature (R, G, B) of the image. ***This function is only available when the input mode is PC.***
Reset	Returns all settings to the factory preset values.

2. POSITION Menu

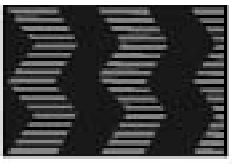
FUNCTION	DESCRIPTION
Horizontal	Adjusts the horizontal position of the projected image. 
Vertical	Adjusts the vertical positon of the projected image. 
Keystone	Corrects any keystoning of the image. 
Zoom	Activates Zoom function.
Resize	When in YPBPR, Video and S-Video modes, users have two options for the image ratio: 4:3 and 16:9. When in PC mode, users have two options for the image ratio: Scaled and Original.

3. SPECIAL Menu

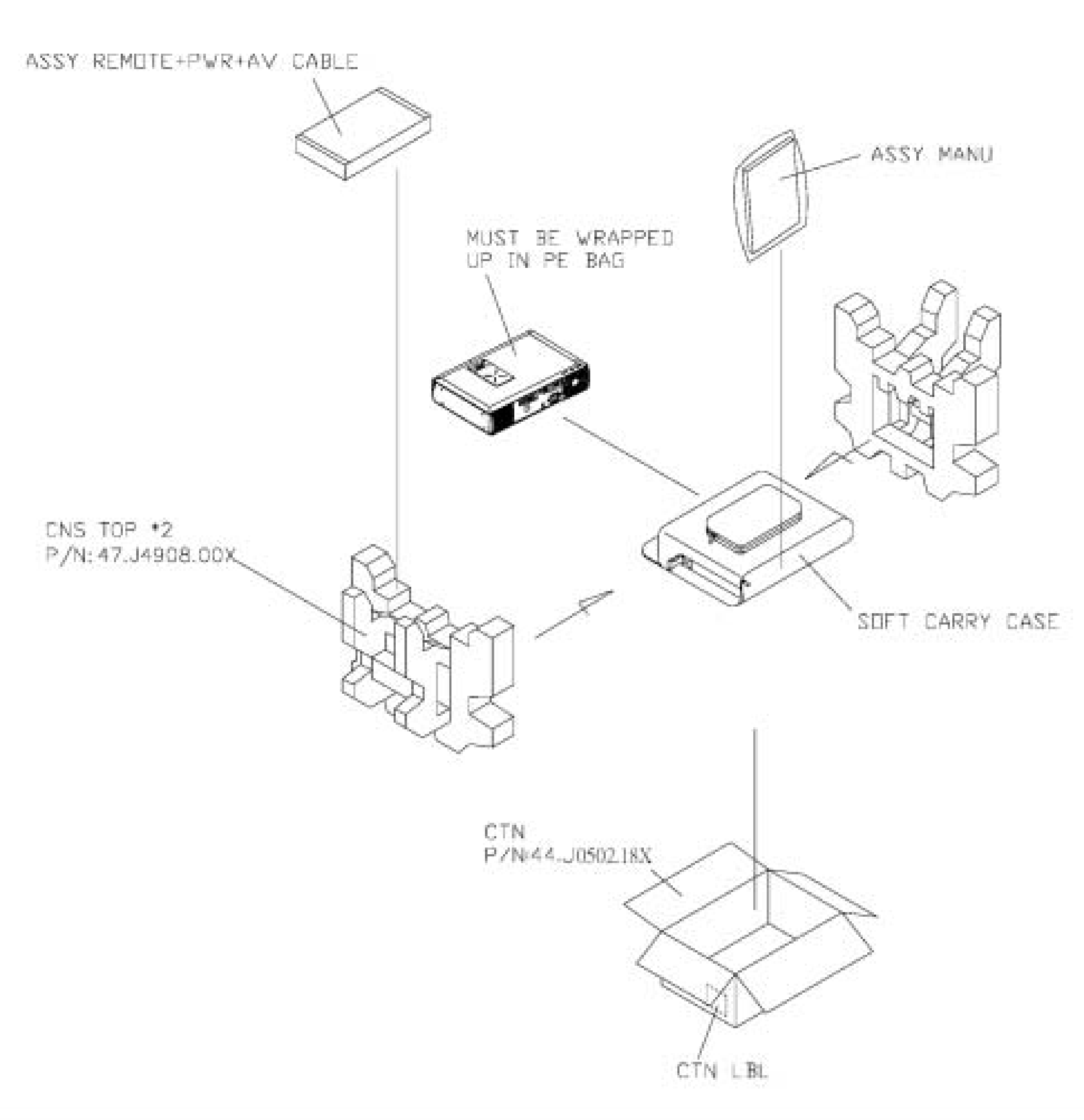
FUNCTION	DESCRIPTION
Source	It's the same function with the SOURCE button on the remote control.
Language	Language sets the language for the OSD control menus. Use the Joystick to select the desired language from among English, French, German, Italian, Spanish, Korean, Simplified Chinese and Traditional Chinese.
Flip Horizontal	Default  Projects images when the projector is 180 degrees horizontally rotated. 
Flip Vertical	Default  Projects images when the projector is 180 degrees vertically rotated. 
Blank Image	Chooses blank image from among blue, black, green and LG logo.
Lamp Time	Shows lamp usage time.

4. TRACKING Menu

This sub-menu only works in PC mode.

FUNCTION	DESCRIPTION
Auto Tracking	It's the same function with the AUTO button on the remote control.
Clock	Adjusts to fit in the desired image size.
Phase	Adjusts to avoid the occurrence of flicker. 

6. Packing Description



1. CARTON SIZE:

INTERNAL DIMENSION : 415 ＊ 325 ＊ 255 mm

EXTERNAL DIMENSION : 425 ＊ 333 ＊ 272 mm (l * w * h)

OUTSIDE DIMENSION : 435 ＊ 345 ＊ 287 mm (L * W* H)

2. SHIPPING CONTAINER

40' CONTAINER DIMENSION : 11980* 2330 * 2360 mm (L * W * H)

20' CONTAINER DIMENSION : 5900 * 2340 * 2360 mm(L * W * H)

3.

	20'(SETS)	40'(SETS)	AIR BY PALLET A	
WITH PALLET	504	1092	30	

4. PALLET SIZE (W*L*H)

A PALLET : 1030*870*130 (mm) →建議做雙向式，才可與 LCOST 共用



CTN LBL PRINTING:

Model Name: **RD-JT31**

Resolution : **SVGA**

Made in Taiwan

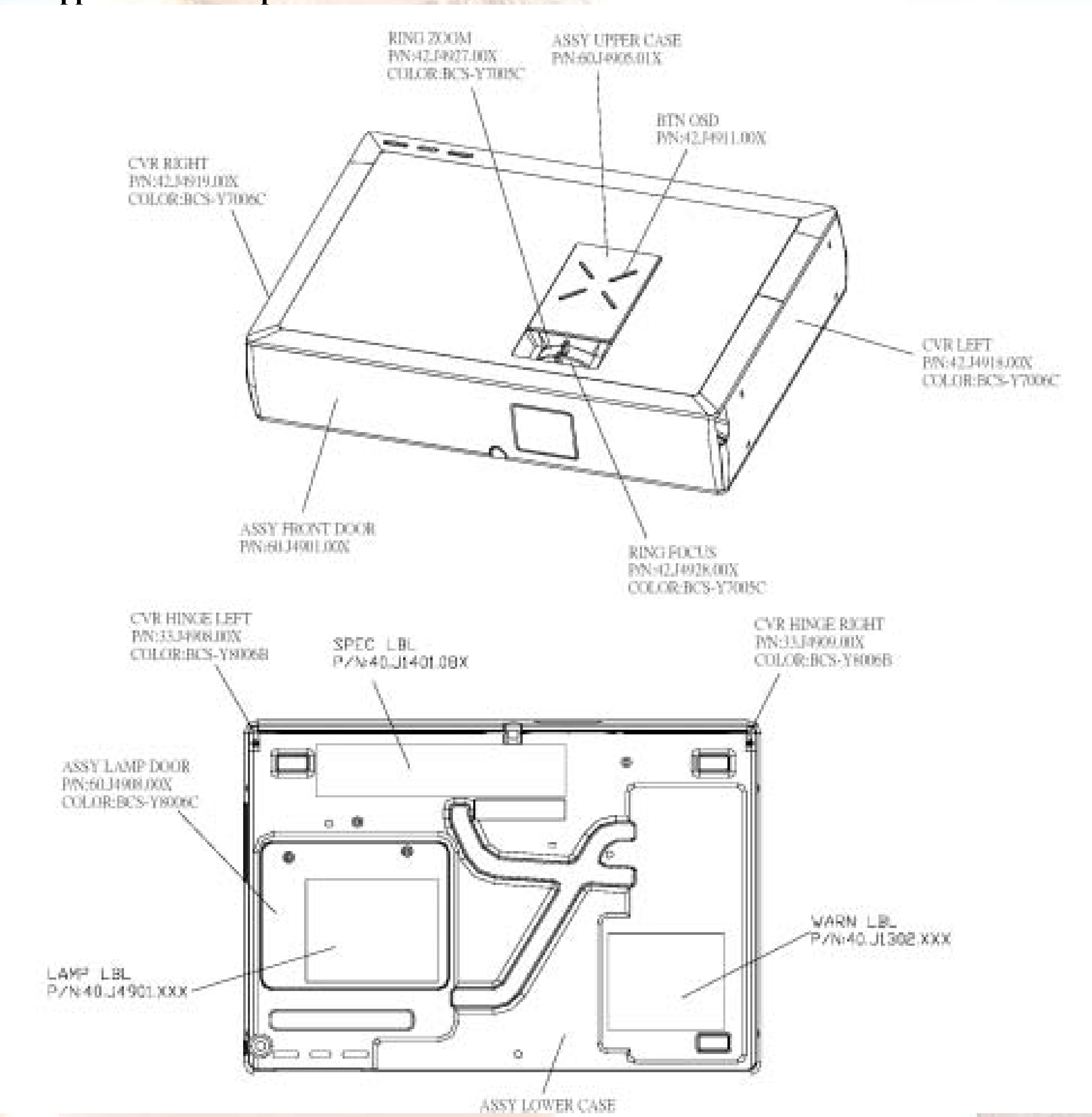
S/N: YMMACXXXXX

BAR CODE 39 (SVGA+ SERIAL NO.)

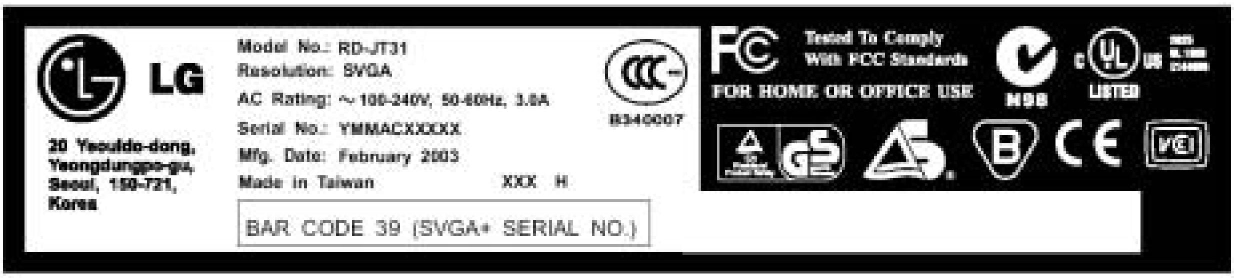
OTHER

P/N:45.L2701.001

7. Appearance Description



1. SPEC LBL PRINTING



40.J1401.151

YEAR (2003)

YMMACXXXXX

MONTH

FIXED

SERIAL NO
(every month need to reset back 00001 counting by both XGA and SVGA together)

2. WARN LBL PRINTING



P/N:40.J1302.051

3. LAMP LBL PRINTING



P/N:40.J4901.001

8. Lamp Replacement

Use and Replacement of the Lamp

The lamp life is 1500 hours. When the Power Indicator lights up red and the Lamp Indicator lights up orange or a message appears suggesting the time of lamp replacement, please install a new lamp or consult your dealer. An old lamp could cause a malfunction in the projector and in rare instances may even explode.

Lamp Replacement

Please check with LG service center for the information of lamp replacement.

⚠ Caution

HIGH VOLTAGE/ HIGH TEMPERATURE/ HIGH PRESS

WHEN REPLACING THE LAMP, TURN OFF THE PROJECTOR AND PULL OUT THE CORD FROM THE RECEPTACLE BEFORE REPLACING THE LAMP.

WAIT UNTIL THE LAMP BECOMES COOL (MINIMUM 45 MINUTES).

TOUCHING THE LAMP WHEN IT IS HOT MAY CAUSE A BURN ON YOUR HAND.

HIGH-PRESSURE LAMP WHEN HOT MAY EXPLODE IF IMPROPERLY HAN-DLED.

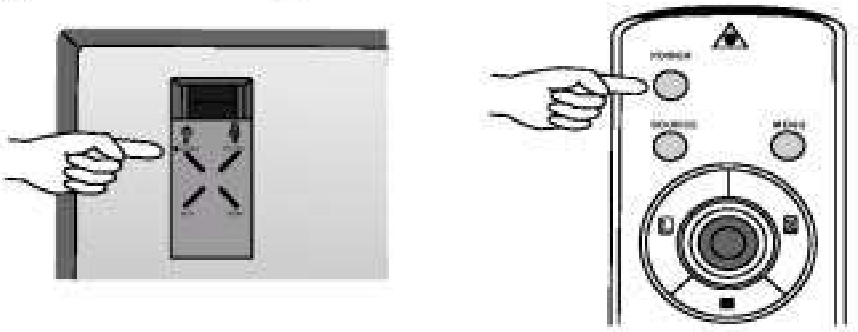
To reduce the risk of injuries to fingers and damage to internal compo-nents, use caution when removing lamp glass that has shattered into sharp pieces.

To reduce the risk of injuries to fingers and/or compromising image quality by touching the lens, do not touch the empty lamp compartment when the lamp is removed.

This lamp contains mercury. Consult your local hazardous waste regula-tions to dispose of this lamp in a proper manner.

9. Shutdown

1. Press **POWER** and a warning message will appear. To turn off the projector, press **POWER** again.

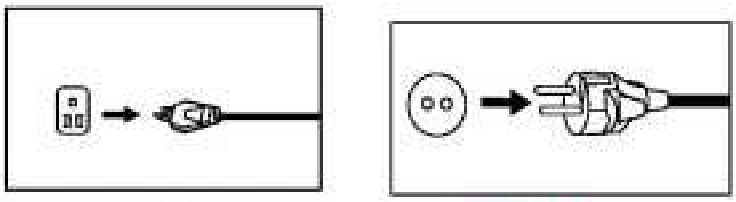




2. To cool down the projector, the fan will continue to run for approximately 90 seconds, during which the LED will flash.

   * **After the projector is turned off, there is a 90-second cooling period before the projector can be re-started.**

3. Disconnect the power cord from the wall socket.



(110V) (220V)

⚠ Caution

- **Please do not unplug the power cord before POWER is shut down or during the two-minute cooling process.**
- **If the projector is not properly shut down, to protect the lamp, the system will detect this and cool the lamp for 90 seconds automatically before turning on again.**

Chapter 4 Circuit Operation Theory

JT31 DMD projector being using the SVGA DMD Engine made by BenQ, it includes front end circuitry, DMD driver circuitry and other peripheral circuitry. The front end circuitry digitizes the input analog VGA and TV signals and make a scaling processes. The DMD driver circuitry is transferring the front-end circuitry to DMD chip. The peripheral circuitry include fan control, LED control, thermal detect, and so on.

1. Whole system circuitry

1.1 Whole system block diagram

The video decoder VPC3230D process multi-standard TV video signal input. The TV video signal support both of composite and S-video input and output YUV format to de-interlace processor FLI2200. The FLI2200 is high performance to enhance video quality.

The DDP1000 transfer signal from PW166 to DMD for driving DMD mirror operation.

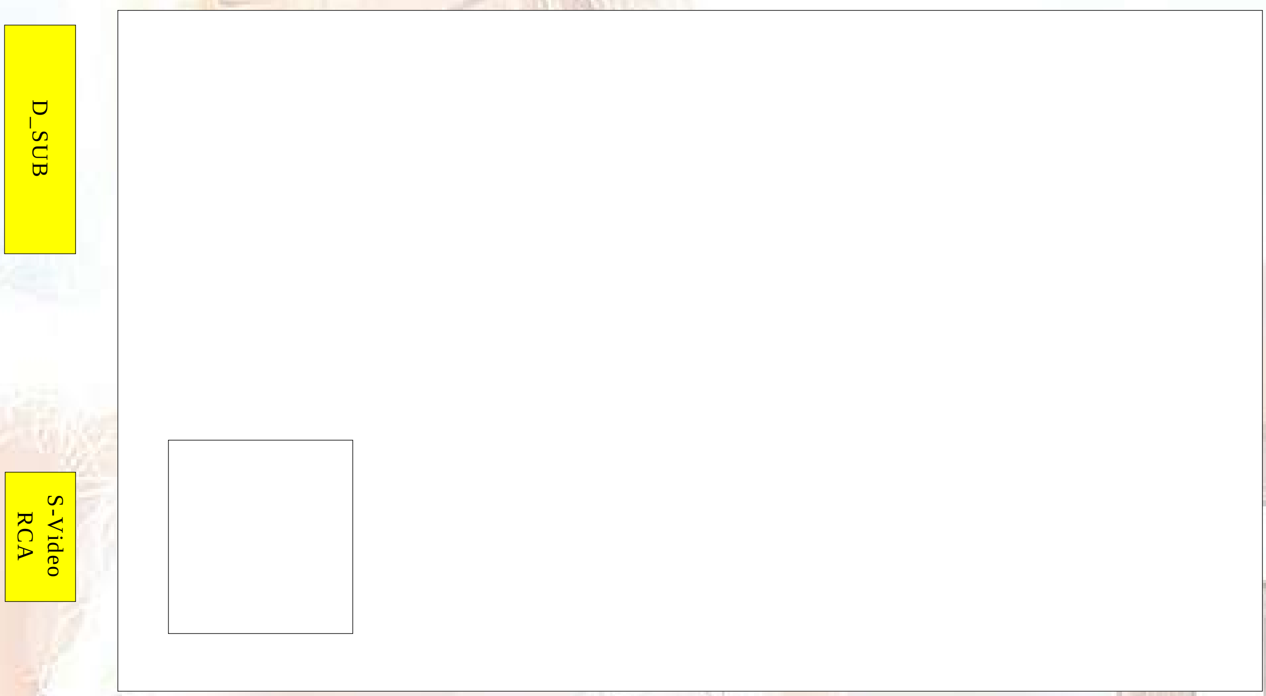
Direct Rambus Memory

The DDP1000 utilizes a high speed Direct Rambus Memory. To support the RDRAM a Direct Rambus clock generator CDCR83 is utilized. It can transfer input clock from 50MHz to 400MHz.

The color Drum motor driver A8904 is 3-phase, 8-pole,Y configuration brush-less DC controller with back-EMF sensing. It provides a serial port to allow the user to program various features
and modes of operation.

2. Frond end circuitry

2.1 Frond end block diagram



DDC interface – Providing Digital Display Channel , which include VCC(Pin9) , SCL(Pin15) , SDA(Pin12) .

- Analog Flat Panel Interface (ADC Converter) , AD9883

The ADC converter digitizes the input analog RGB data signal from D_SUB and output the digital data streams to Image Processor.The normal voltage level of analog RGB input signals is about 0.7V , while the ADC digital signal output to Image Processor is LVTTL level , about 3.3V. The ADC , AD9883 could supports up to pixel rate at about 140MHZ , which is about SXGA 75HZ analog input signal. There are some other interface signals related to AD9883

SOGIN – Sync On Green input from Image Processor, the signal enable the JT31 support the very special VGA input signal.

GCOAST – Input signal from Image Processor, the signal enable the JT31 support the Machintosh analog input format.

GCLK – Output to Image Processor as Pixel Clock, providing the reference clock for Image Processor.

GHS – Providing the Horizontal Synchronization signal to Image Processor.

GVS - Providing the Vertical Synchronization signal to Image Processor.

GRE, GGE, GBE – Digital data stream to Image Processor which is higher than SXGA 75HZ .

- Image Processor (PW166)

The most important IC is the image Processor, here below list its main function.

- Supporting input digital data stream up to UVGA and output digital data up to SXGA.
- Two input port , which are Graphic port (VGA format) and Video port (video decoder format).
  - Frame rate conversion , the output frame rate is independent from the input frame rate and the most important feature of the Image Processor is memory inside , there is no need of external memory for frame rate convertion.
  - Up and Down scaling of different input resolution, ensure the same output image size .
  - Providing Bitmap OSD picture , which if more fancy than normal OSD chip .
- On chip Microprocessor

The Image Processor is a highly integrated circuit, it include MCU, Scaler, Memory, OSD. This will increase the stability of the system.

There is some control signals list below

DCLK – pixel clock output to DDP1000, provided as a reference clock for DMD driver.

DVS – Vertical synchronization signal output to DDP1000, provided as Vertical reference signal for DMD driver.

DHS – Horizontal synchronization signal output to DDP1000, provided as Horizontal reference

signal for DMD driver.

DEN – Data enable signal output to DMD BD, provided as a valid data indicator signal for DMD driver.

VCLK – V-port pixel clock .

VPEN – V-port data enable .

VVS – V-port Vertical Synchronization .

VHS – V-port Horizontal Synchronization .

VFILED – V-port Even/Odd frame indicator .

RESETZ – Output to DDP1000 as RESETZ signal for DMD initialization operation .

LAMPLIT – Input signal as an indicator that the Lamp is ON or OFF

LED1, LED2 – Output to enable the LED ON or OFF .

IRRCVR0 – System IR input to CPU as remote control signals .

MCKEXT – Memory clock to CPU .

DCKEXT – Data clock to for Scaling .

I2C_SDA , I2C_SCL – I2C format data transfer line .

- **VPC3230 Video Decoder and FLI2200 de-interlace**

The VPC3230 is high performance video decoder. The input is RCA video, S-video and 480i. It decode PAL/NTSC/SECAM or YCbCr, and output to de-interlace FLI2200. The de-interlace do some function to enhance the video performance. Such as, Motion-adaptive video de-interlacing, Directional Correlational Deinterlacing (DCDi™) minimizes jaggies on angled lines, Motion-weighted interpolation for video sources produces maximum resolution without introducing motion artifacts, Film-mode for proper handling of 3:2 and 2:2. At last, It output YUV 422 to video port of PW166.

3. DMD driver circuitry

3.1 DMD driver block diagram



4.. JT31 Lamp on Sequence

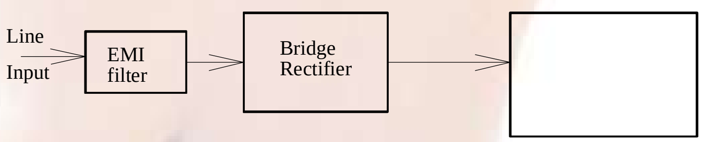
Signal	Voltage Change	Description
PWRGOOD	Low→High	After the power key pressed 3 second continuously, the POWERON signal will activate.
RESETZ	Low→High	DDP1000 will begin initialization.
LAMPEN	Low→High	Lamp lights up.
LAMPLITZ	High→Low	Lamp on indication for DDP1000
LAMPLIT	Low→High	Lamp on indication for PW166

5. JT31 Normal Lamp off Sequence

Signal	Voltage Change	Description
RESETZ	High→Low	DDP1000 goes into a reset state.
LAMPEN	High→Low	Lamp turn off.
LAMPLIT	High→Low	Indicate lamp off.
PWRGOOD	High→Low	DMD is parked

6. Power

6.1. Block Diagram



6.2. general specification

Input voltage : AC 90~264V

Input Frequency: 47~63Hz

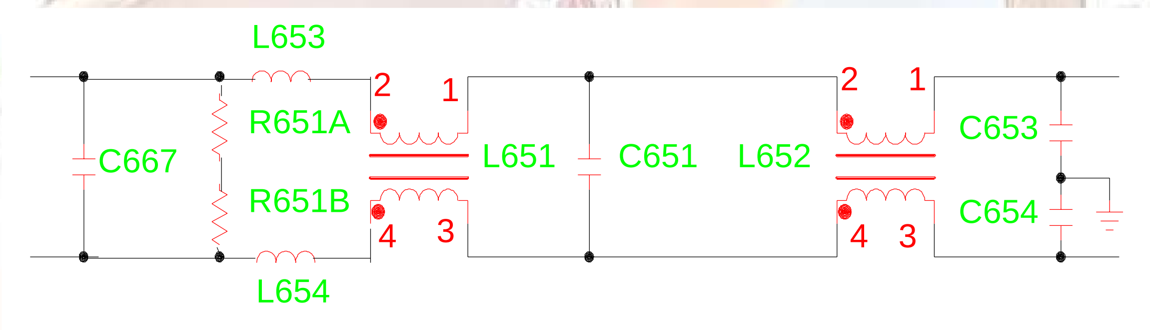
Input power: 230W max

The power circuit shall supply DC power outputs as followings:

	Output Voltage	Typical load current
1	380V	0.45A
2	3.3V	1.8A
3	5V	0.15A
4	12V	0.8A

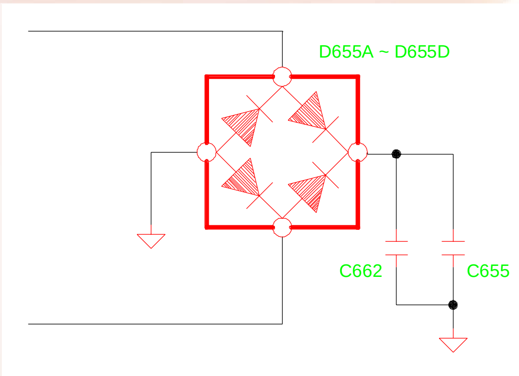
6.3. Circuit Operation Theory

6.3.1 EMI filter



EMI components include common choke L651.L652, X Capacitor C667.C651, Y Capacitor C653.C654. and differential choke L653. L654 and discharge resistor R651A, R651B, This circuit designed to inhibit electric and magnetic interference for meet FCC class B and CISPR class B standard requirements.

6.3.2 Bridge rectifier and filter



D655A~D655D are bridge rectifier, the C662.C655 are filter Capacitor .The AC voltage is rectifier to DC and filter the DC ripple voltage .

6.3.3 Power Factor Correction

The Power Factor Controller IC is L6561 , The function of each pins described as follow.

pin 1 : voltage feedback input

pin 2 : compensation

pin 3 : multiplier input

pin 4 : current sense input

pin 5 : zero current detect input

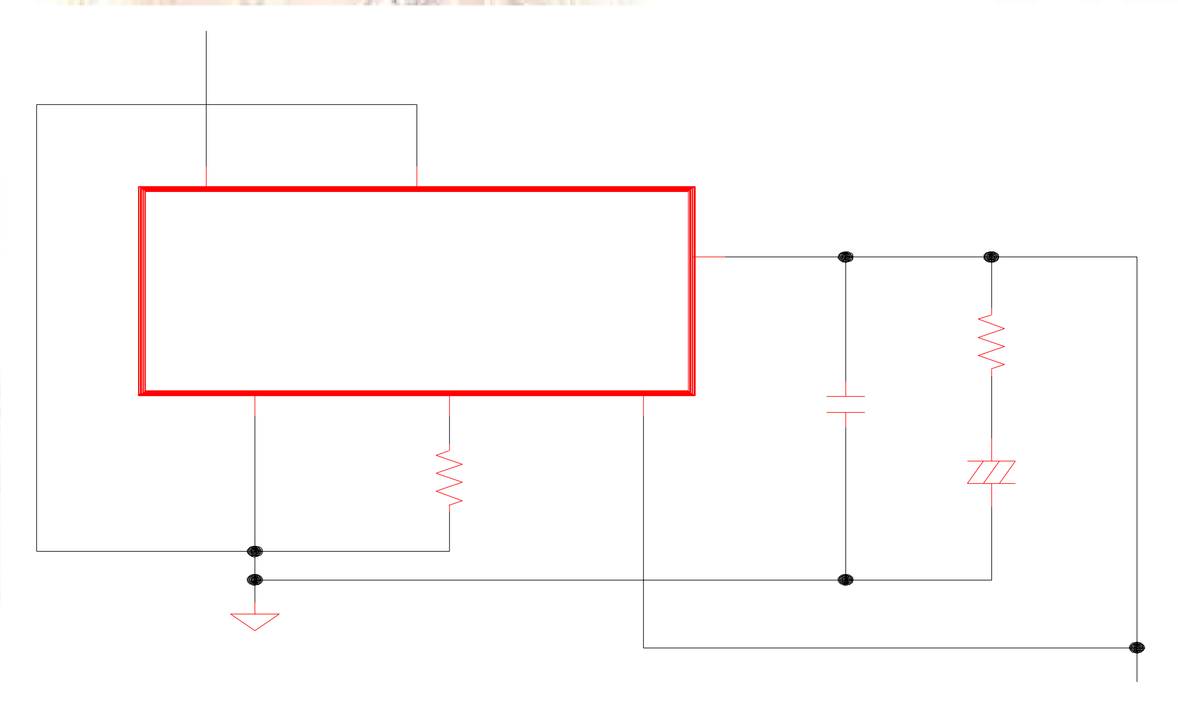
pin 6 : gnd

pin 7 : drive output

pin 8 : vcc

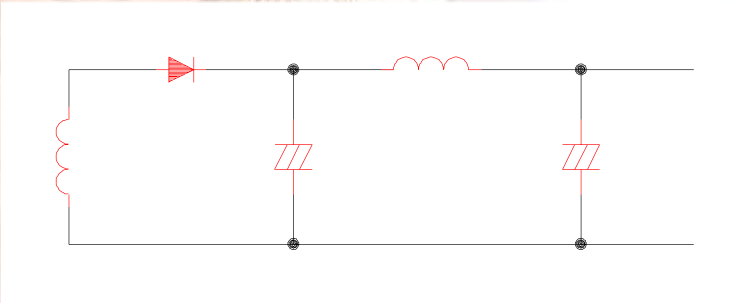
6.3.5 Transformer and snubber circuit of Sub Power Board

6.3.6 Power module IC



The power supply adapt a single feedback circuit of 12.7V. It used IC701 for voltage regulation and IC691 for primary-secondary isolation. The output voltage will be controlled by IC690 pin 1 (feedback) ,the duty cycle of MOSFET will be decided to control the output voltage.

6.3.8 Secondary rectifier and filter



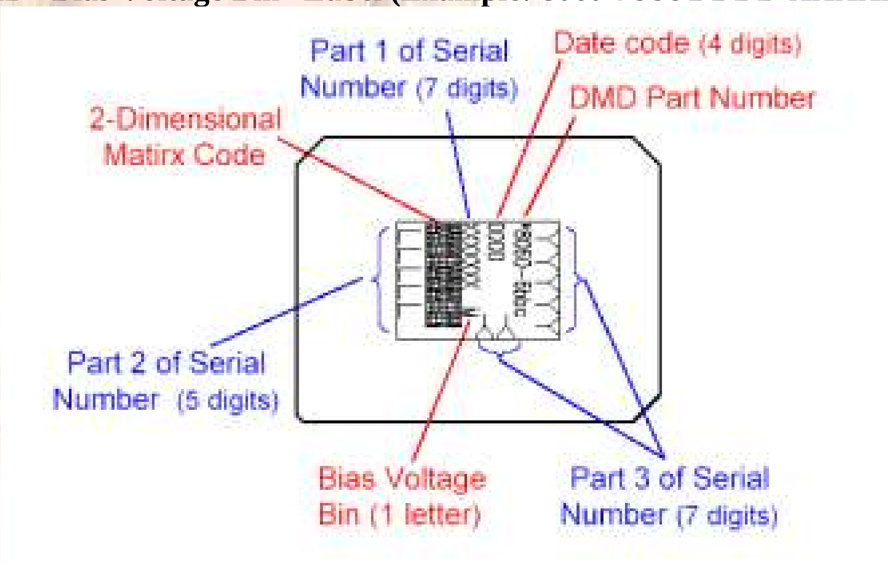
Chapter 5 Alignment Procedure

1.DMD Bias Voltage Alignment

Equipment:None

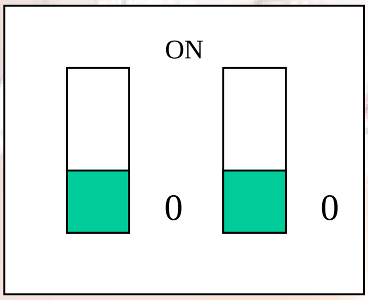
Procedure:

1. **Watch DMD "Bias Voltage Bin" Label (Example: 8060-7bbc DDDD XXXXXXX M)**



2. **Switch the DIP switch (SW2) on Main board according to the red character on the DMD chip**

3. **00: E**
   01: D
   10: C
   11: B



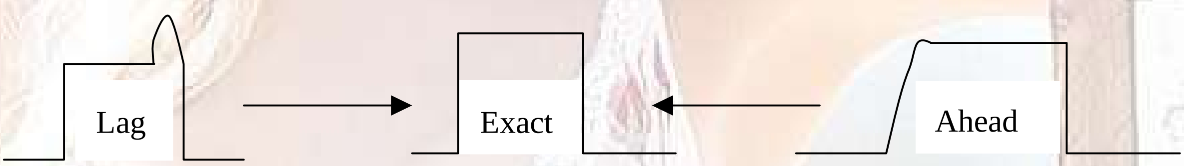
2.Color Wheel Delay Alignment

Equipment:

- **Battery Biased Silicon PIN Detector**
- **Oscilloscope**
- **Probe**

Procedure:

1. **Probe impedance matches 50 ohm**
2. **Open Factory OSD, and select color wheel delay item**
3. **Leave the image pure red (DMD red curtain)**
4. **Put the detector on the screen that red image was projected.**
5. **Watch the oscilloscope and notice the square waveform**
6. **Use the "→" and "←" key to increment or decrement the color wheel delay value**
7. **No matter the waveform is square or not, let the waveform was lagged first**



8. **Then increment or decrement the value to let the waveform to be square**
9. **Do not adjust too much, let the signal get ahead, if it happens, go back to step 7 and do it again.**
10. **Change the input to pure blue and repeat the above procedures again.**

3.PC Color Alignment Procedure

Equipment:

- **Pattern generator**

Procedure:

1. **Connect power, D-sub, into projector.**
2. **Change pattern generator to pattern 43 5-DISC.**
3. **Light on projector**
4. **Enter factory mode.**
5. **Choose ADC Brightness item to Press.**
6. **Choose ADC Contrast item to Press.**
7. **Change pattern generator to pattern 32 gray bar.**
8. **See if any gray level was abnormal, if the abnormality happened, went back to step 4 and then redid it again.**
9. **Quit factory mode, after above adjustments finished.**

4.HDTV Color Adjustment Procedure

Equipment:

- Pattern generator (VG-828)
- Lux meter (CL-100)

Procedure:

(a). Offset adjustment:

1. Black coordinate spec:

	Osram lamp	Oshio lamp
x0	0.281±0.01	0.313±0.01
y0	0.311±0.01	0.329±0.01

2. The variance of color coordinate via Pb offset and Pr offset:

	x	y
Pb offset ↓	x ↓	y ↓
Pb offset ↑	x ↑	y ↑
Pr offset ↓	x ↑	y ↓
Pr offset ↑	x ↓	y ↑

If we line the x and y, then the Pb offset is the shift action and the Pr offset is the rotational action.

3. Connect power, YPbPr Video into projector.

4. Change Timing and pattern of pattern generator :

   Timing : 480P(H:31.54 KHz,V:60.08 Hz)

   pattern : black

5. Light on projector
6. Set user OSD values to default.
7. Enter factory mode.
8. Set Factory values to default.
9. Follow the PbPr offset adjustment flow chart:



5.Optical Engine Assembly Procedure

Note:

1.Every operator must check the dust/chip on every optical component before assembly.

2.Dust remove procedure is defined in document 01.

No.	Stop	Check	Action	Review	Equipment
1.	ROD	Remove dust on ROD			
			Assemble Clip Rod Btm		Screw driver
			Put a little glue on ROD align surface		glue CA064
		Pull the clip backward by screw driver	Assemble ROD		Screw driver
			Assemble clip rod top		
			Assemble clip rod side		Screw driver
2	Assy C1C2 module	Check the followed direction of C1C2 on SOP	Assemble c1c2 module		Screw driver
3.	Assy FM on holder	make sure the direction of mirror is precise	1.Put glue 727 on three slot datum of holder 2.put A649 on the back of mirror 3.Assemble mirror on holder by glue		Glue 727 and Activator A649
4.	Assy FM Module		Assemble FM module on Dmd Hsg with spring and adjust screw washer		Screw driver
		Keep the original position of fold mirror	Control the 1.65mm between Hsg and holder by jig or torgue		Screw driver jig

5.	Assy C3 Lens on Holder Lens C3	Make sure Lens C3 is exactly contacted on related datum of holder	Assemble lens C3 on holder		UV glue and UV gun

6.	Assemble C3 module on hsg		Assemble C3 module on hsg		Screw Driver
7.	Assemble TIR on Hsg	Make sure TIR is exactly contacted related datum of hsg	1. put glue 727 on 4 Hsg Datum 2. Put CA064 on bottom surface of TIR 3. Assemble TIR on Hsg		Glue 727 Activator A649
8.	Assemble Color Drum on bkt	1. Follow the screw torgue 2. avoid straight load toward bearing	Assemble color drum/ bd_sensor on bkt motor mount	Screw torgue 1kgf	
9.	Assemble Color Drum module on HSG	Avoid interfere with ROD during assembling	Assemble Color drum module on Hsg		Screw driver
	Assemble cvr color drum	1.avoid interfere with color drum 2. Make sure CVR's location is correct	Assemble CVR Color drum module on Hsg		Screw driver
		Check interfere after assembling			

10.	DMD Module/Engine Test		Assemble DMD/DMD_BD/ projection lens on Hsg	DMD contact Cspring contact	Screw Driver(M2) for DMD
			Over Fill adjust	Adjust three screws of FM module	
			C/W delay adjust and Engine Test		Senser and Oscilloscope
			Fix FM by glue		Screw Glue

6. Power Alignment

1. PFC Output voltage

   Output voltage range: 340 ~ 410VDC

   Output current: 0.025 ~ 0.45ADC

   Input voltage: 110VAC or 220VAC, 50 or 60Hz

2. DC/DC Output voltage

Output voltage	Output voltage range	Output current
+3.3V	3.20 ~ 3.55V	0.5 ~ 1.7A
+5V	4.75~ 5.25V	0.1 ~ 0.15A
+12V	11.9~ 13.2V	0.1 ~ 0.8A

   Input voltage (from Line and Neutral): 110VAC or 220VAC, 50 or 60Hz

Common Problems & Solutions

PROBLEMS	TRY THESE SOLUTIONS
NO POWER	• Make sure the power cord is inserted snuged into the AC adapter socket. • Make sure the power cord is inserted snuged into the power outlet. • Wait 90 seconds after the projector is turned off before turning the projector back on.
NO PICTURE	• Check for the proper input source. • Ensure all cables are connected properly. • Adjust the brightness and contrast. • ~~Remove the len cap.~~
TRAPEZOID IMAGE ON THE SCREEN	• Reposition the unit to improve its angle on the screen. • Use the **Keystone** correction key on the remote control unit.
POOR COLOR	• Select the correct video system. • Adjust brightness, contrast, or saturation.
BLURRED IMAGE	• Press **Auto** on the control panel of the projector or the remote control unit to get better picture quality. • Adjust the focus. • Reposition the unit to improve its projection angle. • Ensure the distance between the unit and screen is within the adjustment range of the lens.
REMOTE CONTROL DOES NOT WORK	• Replace the batteries with new ones. • Make sure there is no obstacle between the remote control and the projector. • ~~Stand within 9 meters of the projector.~~ • Make sure nothing is blocking the front and rear receivers.

Status Messages

On-Screen Messages	Description
No Signal	Projector is searching for input.
Out of Range	Input signal frequency exceeds the projector's range.

Replace the Lamp	The lamp has been in operation for over 1500 hours. The warning message will display on screen. Repalce the lamp when the warning message displays or the projector may not be turned on.

Optical Engine trouble shooting guide

Debug Item	Trouble Shooting Guide
1. Brightness	1. Chk EE setting / Follow up EE alignment procedure 2. Chk fold mirror position / re-align fold mirror to be closer to design position. 3. Chk Rod lens at datum surface / put rod lens at right datum surface 4. Chk Green color / If too green and over spec., change color drum 5. Change lamp
2. Uniformity	1. Chk fold mirror position / re-align fold mirror to be closer to design position 2. Chk lamp / Re-assembly lamp
3. On/Off Contrast	1. Chk projection lens clean / To clean projection lens 2. Chk TIR and DMD clean / To clean TIR and DMD
4. ANSI Contrast	1. Chk projection lens clean / To clean projection lens 2. Change projection lens
5. Color	Chk Front glass Chk color drum 50% point for every segment
6. Color Uniformity	Chk DMD Chk rod output surface
7. Focus	1. Chk TIR at datum surface / Change HSG and TIR 2. Chk focus by Focus formula Y=-0.00037X+0.002 (X at the front of Screen is – and at rear of Screen is +)/ assembly slim metal sheet on projection lens
8. Dust	1. Clean rod output surface 2. Clean DMD surface

JT31 Electrical Debug Guide

System no work — Yes →

1.chk voltage input from DC/B : 3.3V(TP23),5V(TP24),12V(TP34)
2.chk oscillator Y4,Y5 output frequency (Y4:16.257MHz, Y5:10MHz))
3.chk MCLK(U37-5,130MHz) and DCLK(U39-5,40MHz)
4.chk U38 whether S/W inside or bad soldering
5.chk Reset IC (U40)
6. change U35(bad soldering)
7.chk Abnormal signal
8.chk Resetz(RN40),PWRGOOD(RN40) ,VSYNCZ(R182), HSYNCZ(R183), ACTDATA(R184), CLKIN(R181)

No ↓

No data to DDP1000 — Yes →

1.chk output from U32(RN16-RN21) [graphics input]
2.chk output from U109 (RN101 - RN104) [video input]
3.chk U1and its peripherals (as above block)

No ↓

No image — Yes →

1.chk DDP1000 debug guide

No ↓

No image when graphics is the current input — Yes →

1.chk D_SUB cable and J103
2.chk VSYNC(U103-4),HSYNC(U105-4)
3.chk U32 voltage source U29-2(3.3V),U30-2(3.3V),L22(3.3V)
4.chk GHS1(R171), GVS1(R170), GCLK(R173)
5.chk U3 2soldering
6.change U32

No ↓

No image when video is the current input — Yes →

1.chk video input connector J12 and J102
2.chk U107 voltage source L110(5V), L111(3.3V),VSTBY(U107-59)
3.chk Y101 output frequency(20.25MHz)
4.chk U107 output signals to U109 (Y0~Y7, UV0~UV7)
5.chk U107 soldering
6.chagne U107

No ↓

Unable to download — Yes →

1.chk U20 enable pins(1,4)
2.change U20

No ↓

Unable to save OSD setting — Yes →

1.change U41

No ↓

Keypad malfunction — Yes →

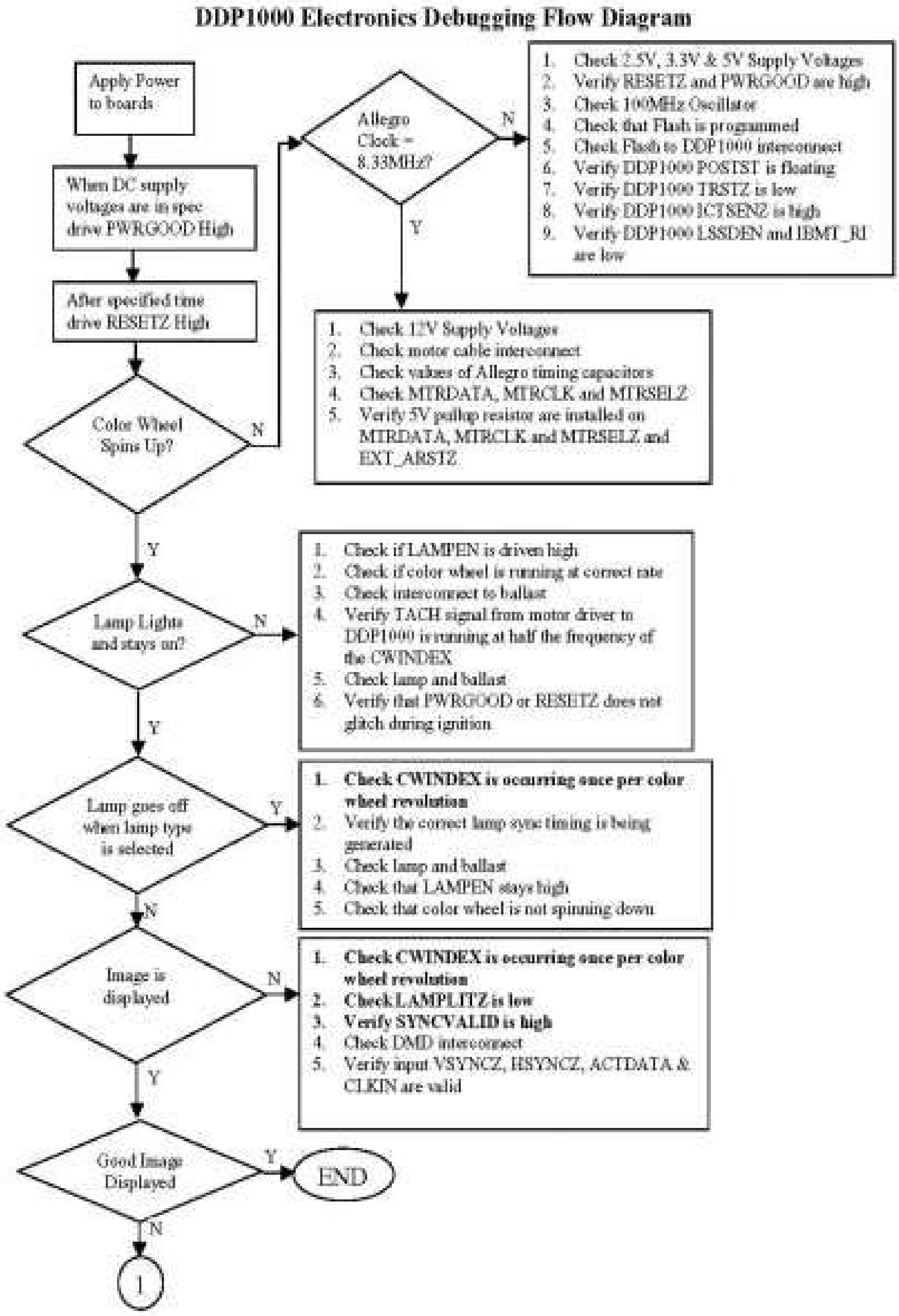
1.chk R103~R106 soldering
2.chk U18(74AHC244)

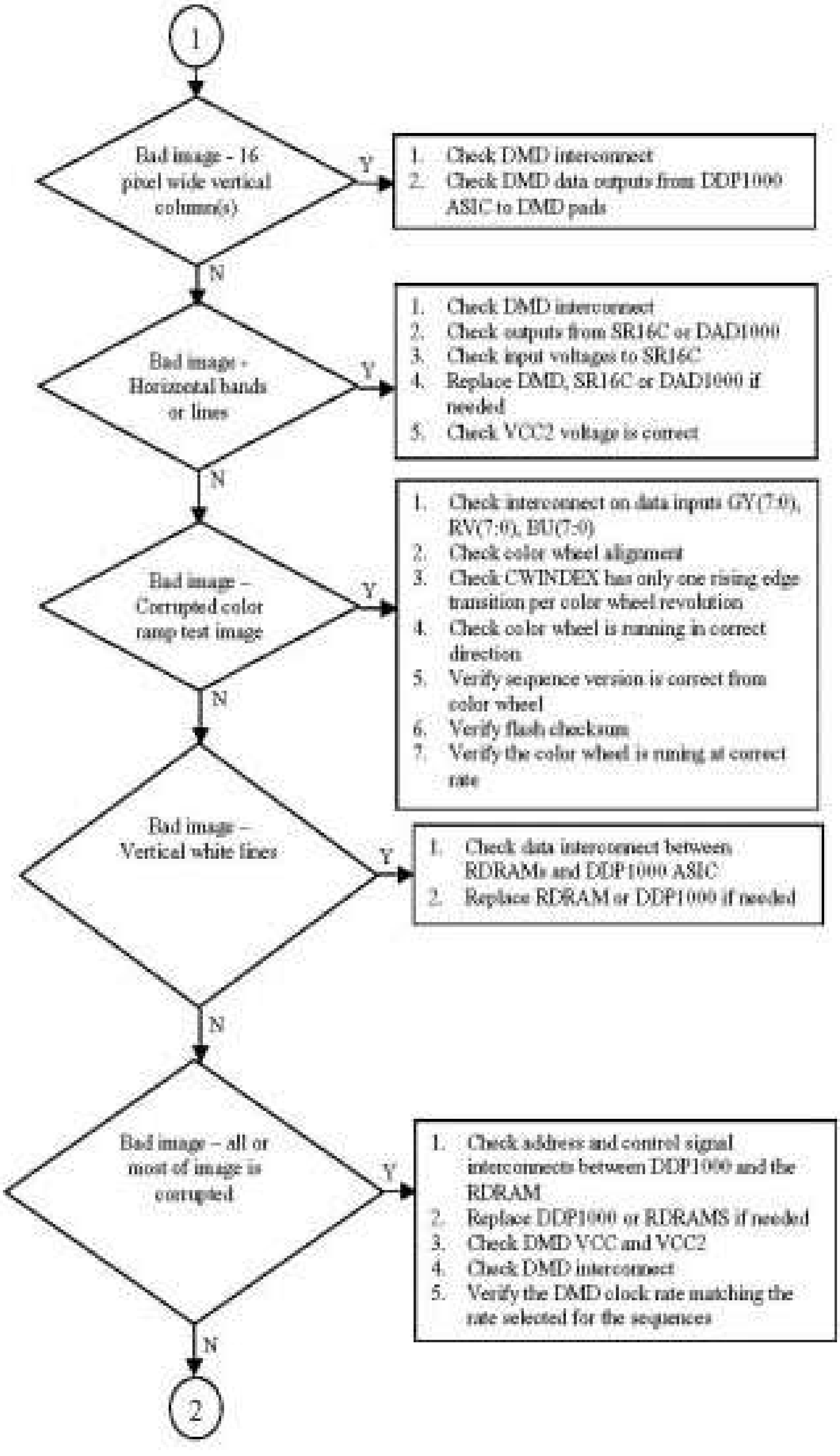
No ↓

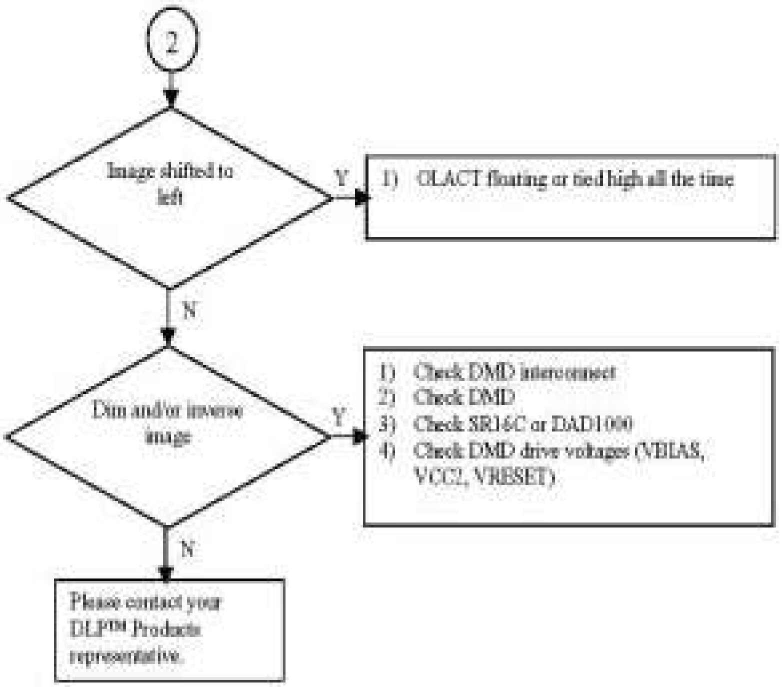
No ↓

Image crossover distortion or contour — Yes →

1.chk soldering from RN16~RN21 (graphics input)
2.chk slodering from RN101~RN104 (video input)

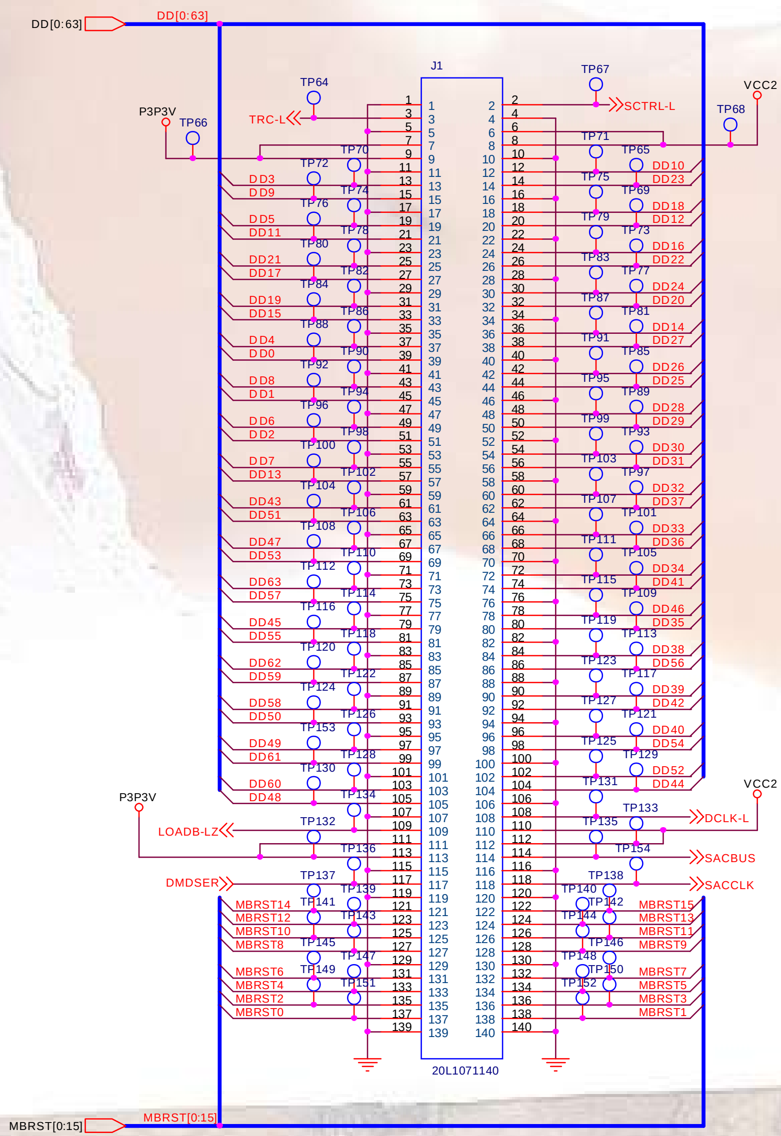

DDP1000 Electronics Debugging Flow Diagram
Apply Power to boards
When DC supply voltages are in spec drive PWRGOOD High
After specified time drive RESETZ High
Color Wheel Spins Up?
Allegro Clock = 8.33MHz?
1. Check 2.5V, 3.3V & 5V Supply Voltages
2. Verify RESETZ and PWRGOOD are high
3. Check 100MHz Oscillator
4. Check that Flash is programmed
5. Check Flash to DDP1000 interconnect
6. Verify DDP1000 POSTST is floating
7. Verify DDP1000 TRSTZ is low
8. Verify DDP1000 ICTSENZ is high
9. Verify DDP1000 LSSDEN and IBMT_RI are low
1. Check 12V Supply Voltages
2. Check motor cable interconnect
3. Check values of Allegro timing capacitors
4. Check MTRDATA, MTRCLK and MTRSELZ
5. Verify 5V pullup resistor are installed on MTRDATA, MTRCLK and MTRSELZ and EXT_ARSTZ
Lamp Lights and stays on?
1. Check if LAMPEN is driven high
2. Check if color wheel is running at correct rate
3. Check interconnect to ballast
4. Verify TACH signal from motor driver to DDP1000 is running at half the frequency of the CWINDEX
5. Check lamp and ballast
6. Verify that PWRGOOD or RESETZ does not glitch during ignition
Lamp goes off when lamp type is selected
1. Check CWINDEX is occurring once per color wheel revolution
2. Verify the correct lamp sync timing is being generated
3. Check lamp and ballast
4. Check that LAMPEN stays high
5. Check that color wheel is not spinning down
Image is displayed
1. Check CWINDEX is occurring once per color wheel revolution
2. Check LAMPLITZ is low
3. Verify SYNCVALID is high
4. Check DMD interconnect
5. Verify input VSYNCZ, HSYNCZ, ACTDATA & CLKIN are valid
Good Image Displayed
END
1
Y
N


1
Bad image - 16 pixel wide vertical column(s)
Y
1. Check DMD interconnect
2. Check DMD data outputs from DDP1000 ASIC to DMD pads
N
Bad image - Horizontal bands or lines
Y
1. Check DMD interconnect
2. Check outputs from SR16C or DAD1000
3. Check input voltages to SR16C
4. Replace DMD, SR16C or DAD1000 if needed
5. Check VCC2 voltage is correct
N
Bad image – Corrupted color ramp test image
Y
1. Check interconnect on data inputs GY(7:0), RV(7:0), BU(7:0)
2. Check color wheel alignment
3. Check CWINDEX has only one rising edge transition per color wheel revolution
4. Check color wheel is running in correct direction
5. Verify sequence version is correct from color wheel
6. Verify flash checksum
7. Verify the color wheel is running at correct rate
N
Bad image – Vertical white lines
Y
1. Check data interconnect between RDRAMs and DDP1000 ASIC
2. Replace RDRAM or DDP1000 if needed
N
Bad image – all or most of image is corrupted
Y
1. Check address and control signal interconnects between DDP1000 and the RDRAM
2. Replace DDP1000 or RDRAMS if needed
3. Check DMD VCC and VCC2
4. Check DMD interconnect
5. Verify the DMD clock rate matching the rate selected for the sequences
N
2

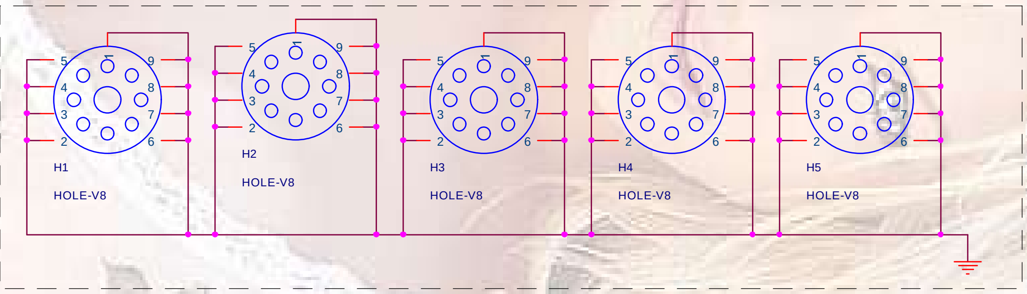

2
Image shifted to left
Y
1) GLACT floating or tied high all the time
N
Dim and/or inverse image
Y
1) Check DMD interconnect
2) Check DMD
3) Check SR16C or DAD1000
4) Check DMD drive voltages (VBIAS, VCC2, VRESET)
N
Please contact your DLP™ Products representative.

POWER BOARD trouble shooting guide

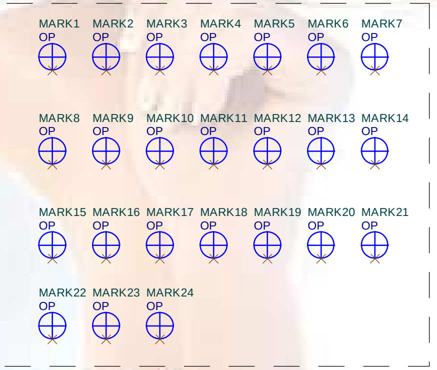
DMD DRIVER



Screw Holes

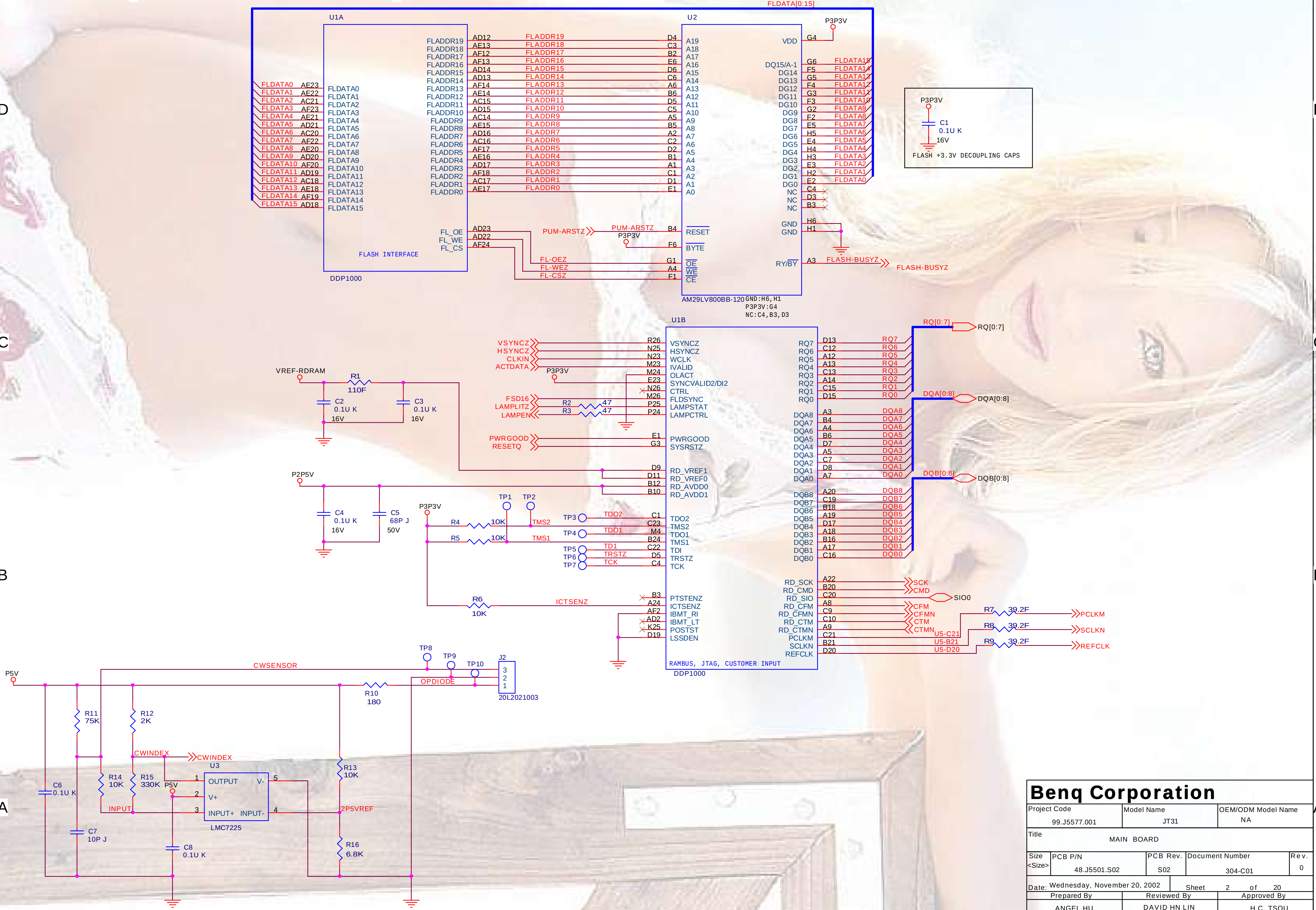


Optical Points



Benq Corporation

Project Code 99.J5577.001	Model Name JT31	OEM/ODM Model Name NA
Title MAIN BOARD		
Size <Size> / PCB P/N 48.J5501.S02	PCB Rev. S02	Document Number 304-C01 / Rev. 0
Date: Wednesday, November 20, 2002	Sheet 1 of 20	
Prepared By ANGEL HU	Reviewed By DAVID HN LIN	Approved By H.C. TSOU



Benq Corporation

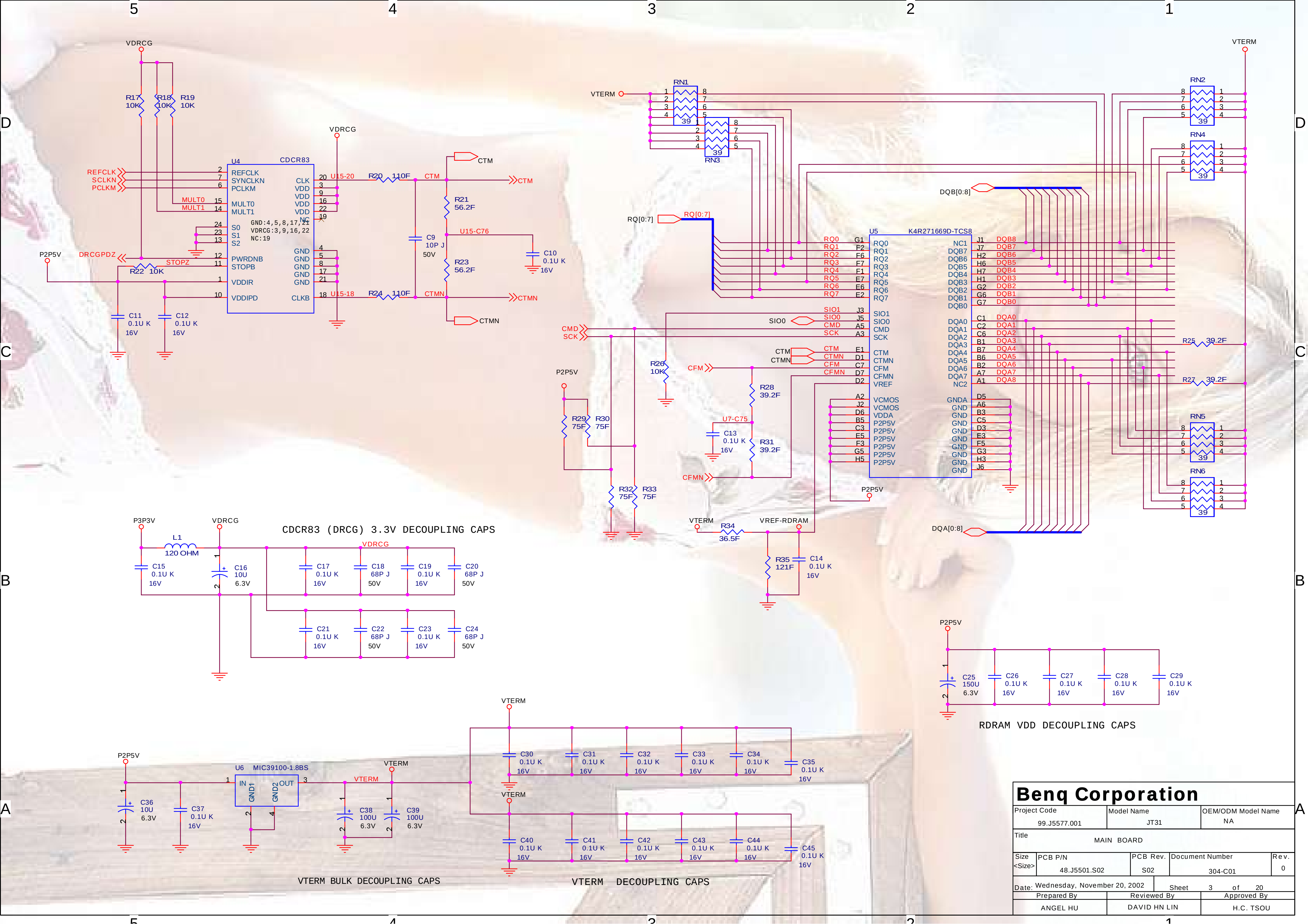
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 — Sheet 2 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation

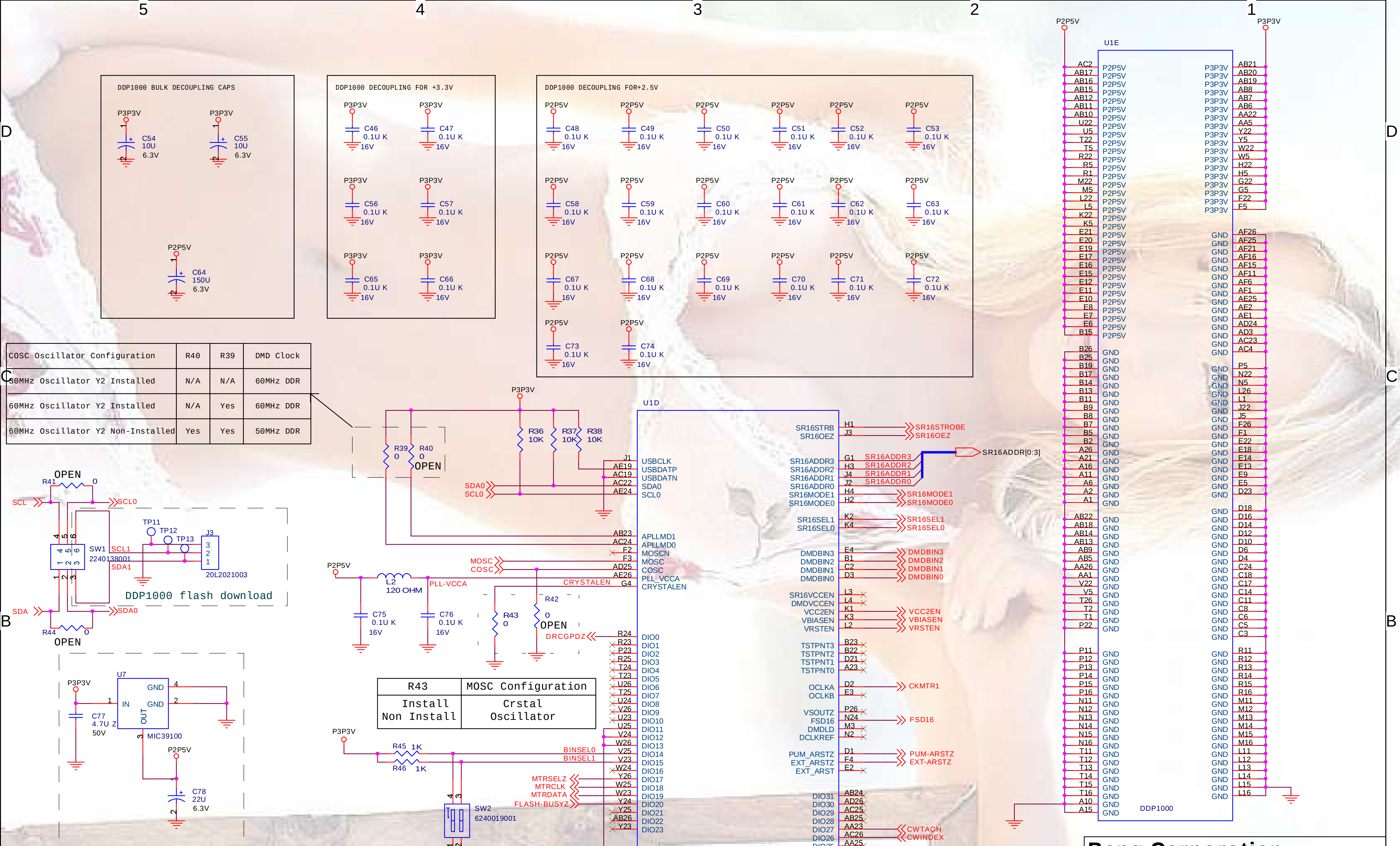
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 — Sheet 3 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



COSC Oscillator Configuration	R40	R39	DMD Clock
30MHz Oscillator Y2 Installed	N/A	N/A	60MHz DDR
60MHz Oscillator Y2 Installed	N/A	Yes	60MHz DDR
60MHz Oscillator Y2 Non-Installed	Yes	Yes	50MHz DDR

R43	MOSC Configuration
Install	Crstal
Non Install	Oscillator

BINSEL1	BINSEL0	DMD Bin
0	0	B
0	1	C
1	0	D
1	1	E

Benq Corporation

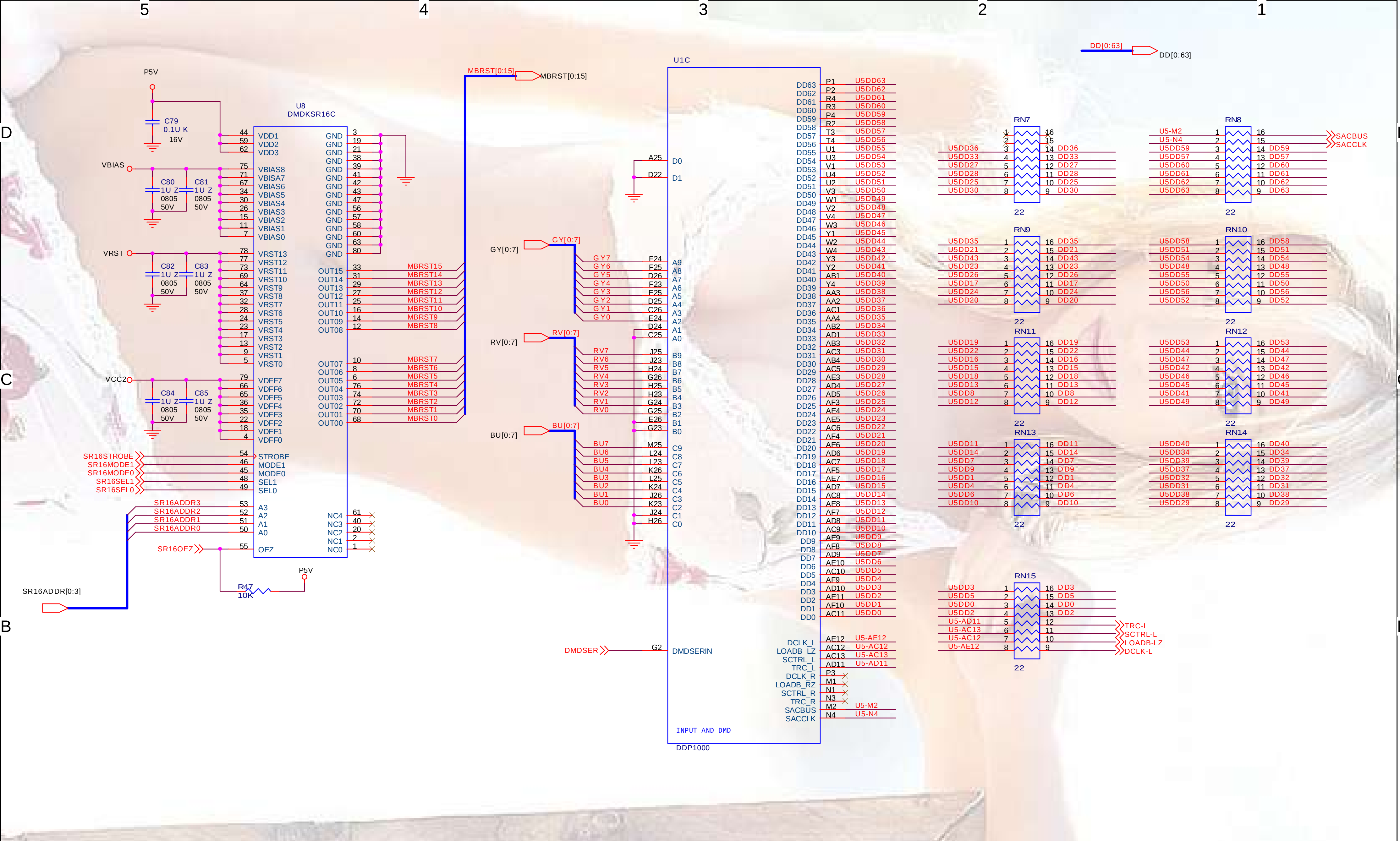
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

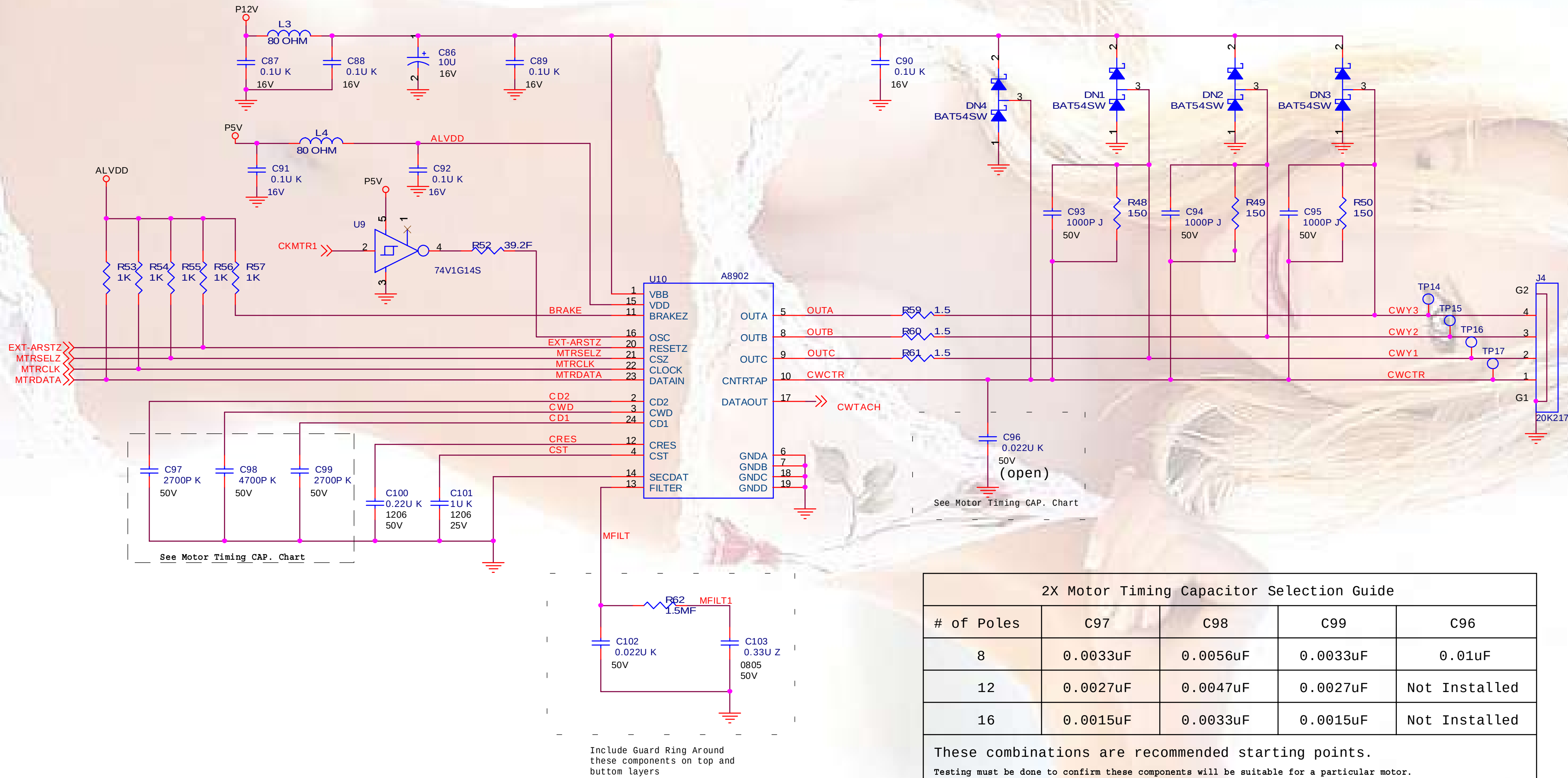
Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 Sheet 4 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation		
Project Code: 99.J5577.001	Model Name: JT31	OEM/ODM Model Name: NA
Title: MAIN BOARD		
Size: <Size>	PCB P/N: 48.J5501.S02	PCB Rev.: S02
Document Number: 304-C01	Rev.: 0	
Date: Wednesday, November 20, 2002	Sheet 5 of 20	
Prepared By: ANGEL HU	Reviewed By: DAVID HN LIN	Approved By: H.C. TSOU



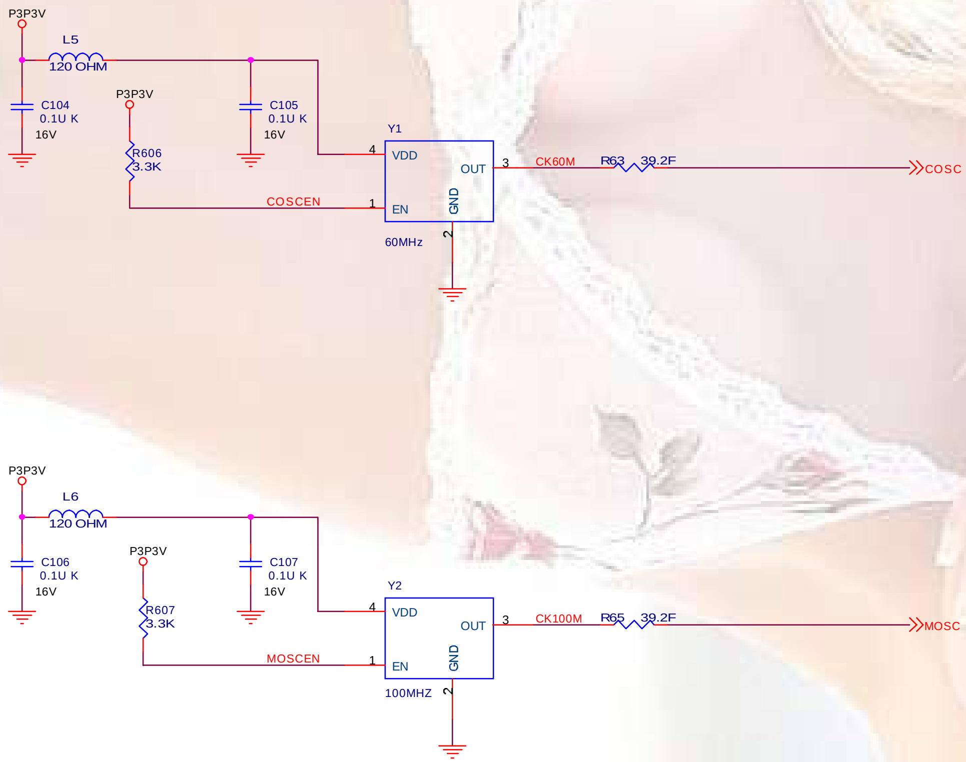
2X Motor Timing Capacitor Selection Guide				
# of Poles	C97	C98	C99	C96
8	0.0033uF	0.0056uF	0.0033uF	0.01uF
12	0.0027uF	0.0047uF	0.0027uF	Not Installed
16	0.0015uF	0.0033uF	0.0015uF	Not Installed

These combinations are recommended starting points.

Testing must be done to confirm these components will be suitable for a particular motor.

Benq Corporation

Project Code: 99.J5577.001	Model Name: JT31	OEM/ODM Model Name: NA
Title: MAIN BOARD		
Size: <Size>	PCB P/N: 48.J5501.S02	PCB Rev.: S02
Document Number: 304-C01	Rev.: 0	
Date: Wednesday, November 20, 2002	Sheet 6 of 20	
Prepared By: ANGEL HU	Reviewed By: DAVID HN LIN	Approved By: H.C. TSOU



Benq Corporation

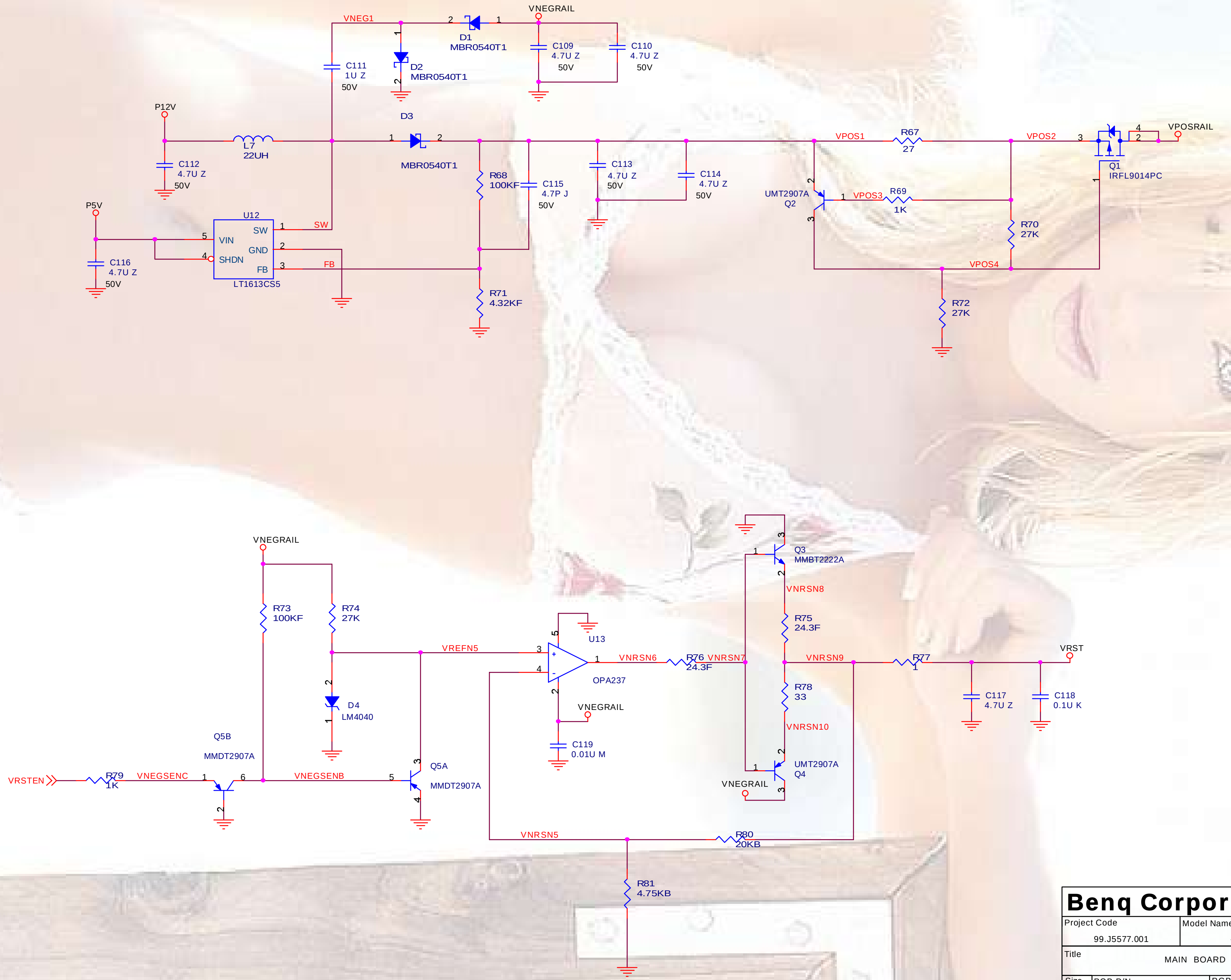
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title	
	MAIN BOARD

Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 Sheet 7 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation

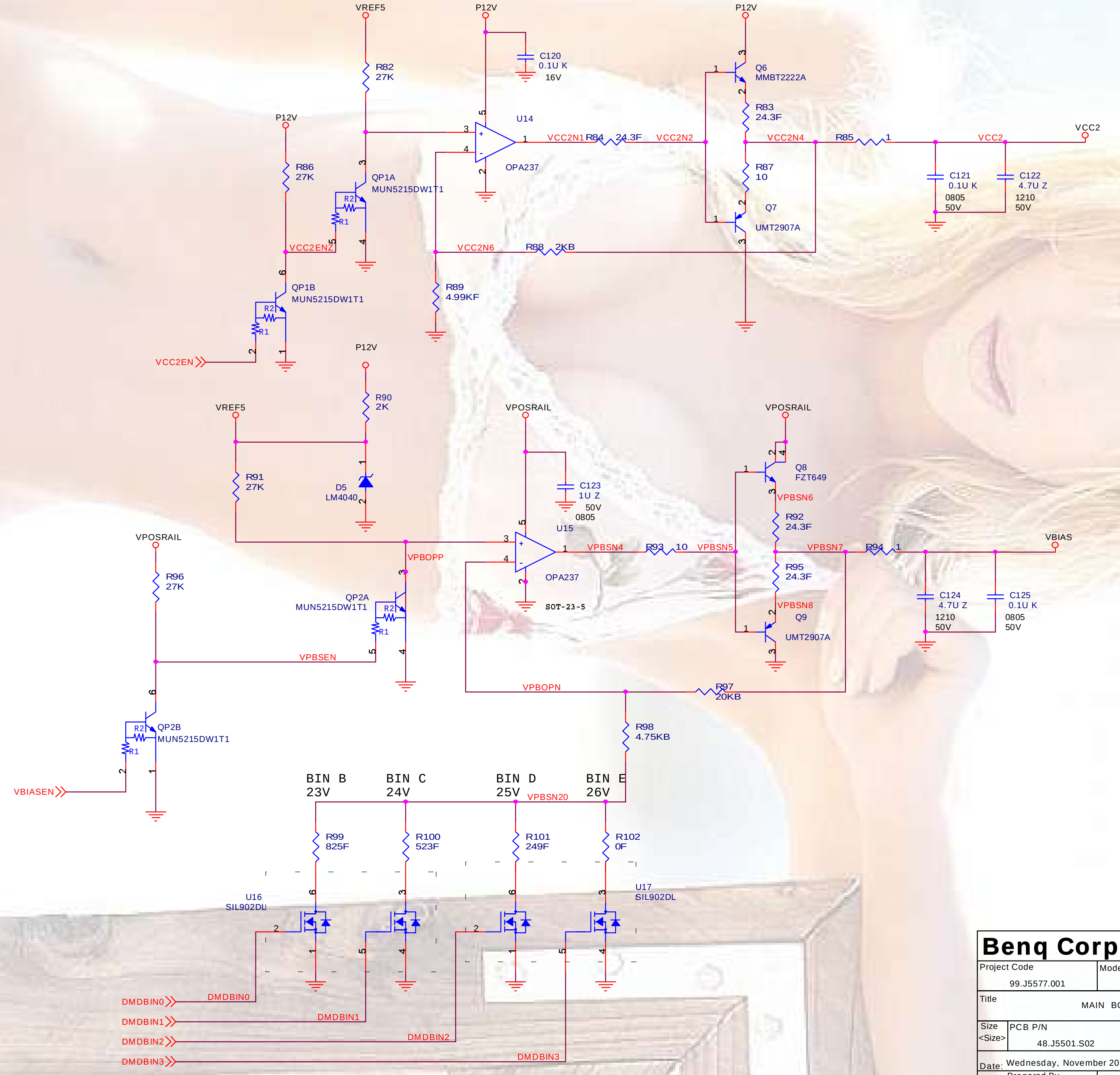
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 Sheet 8 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation

Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

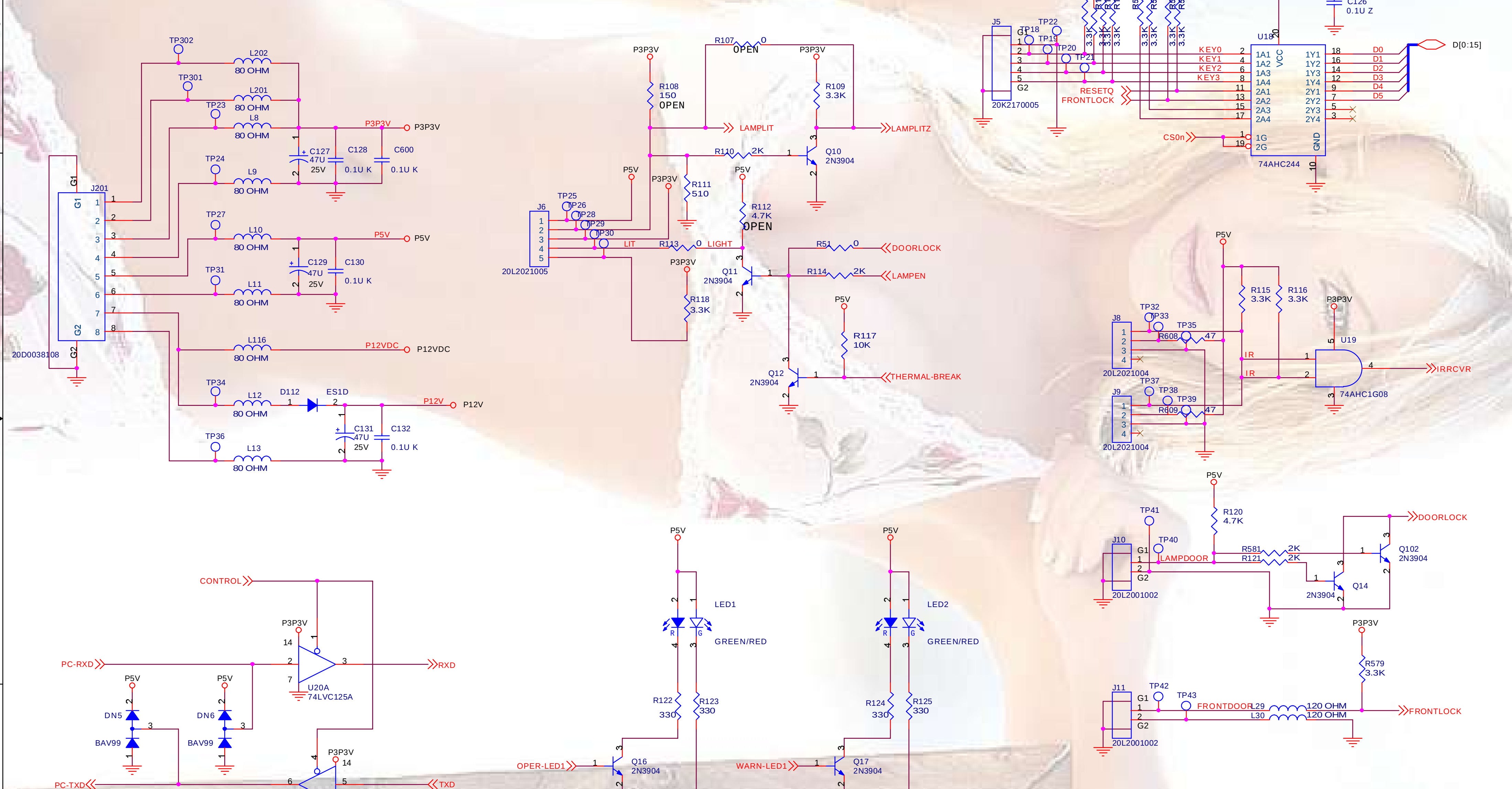
Title: MAIN BOARD

Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 — Sheet 9 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU

MAIN BOARD



Benq Corporation

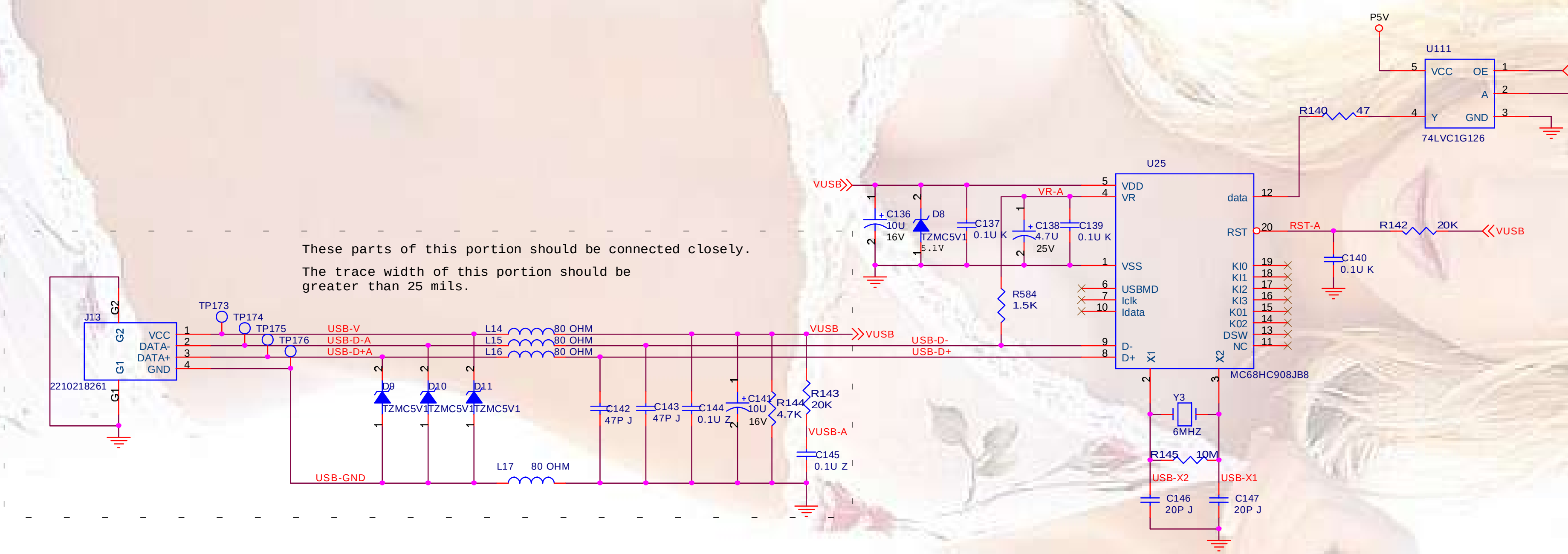
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title	MAIN BOARD

Size	PCB P/N	PCB Rev.	Document Number	Rev.
<Size>	48.J5501.S02	S02	304-C01	0

Date: Wednesday, November 20, 2002 — Sheet 10 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation

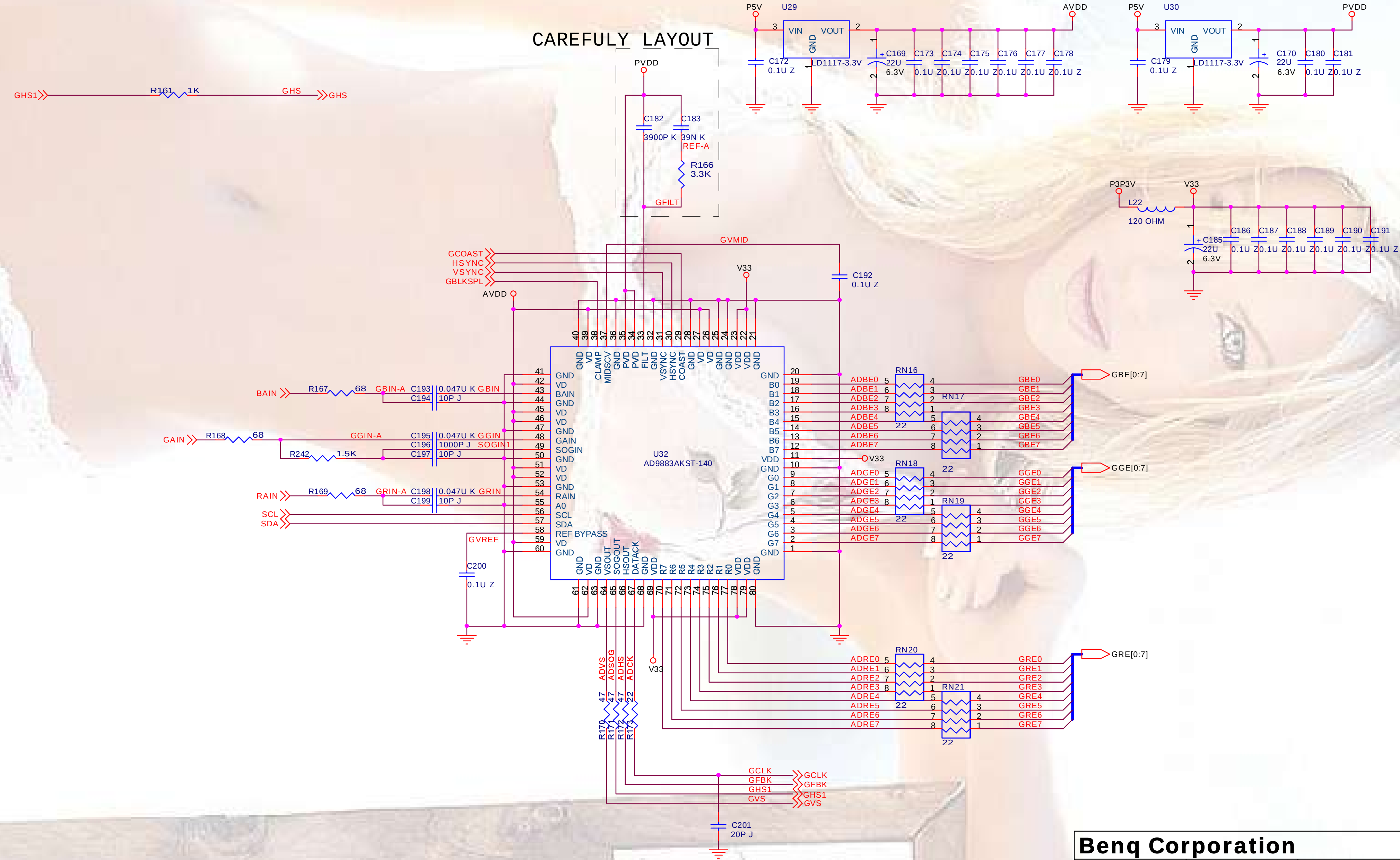
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

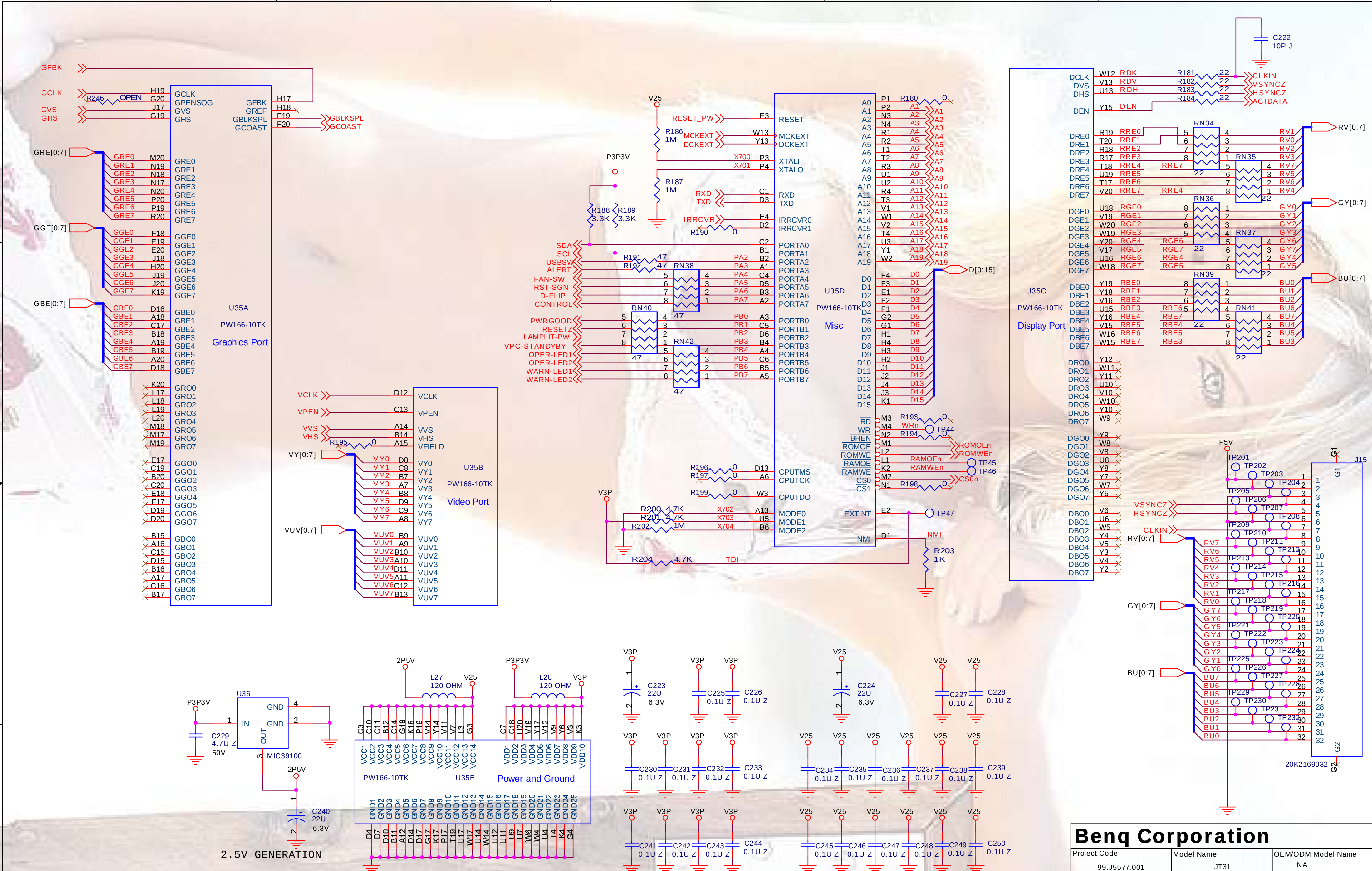
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Date: Wednesday, November 20, 2002 — Sheet 11 of 20

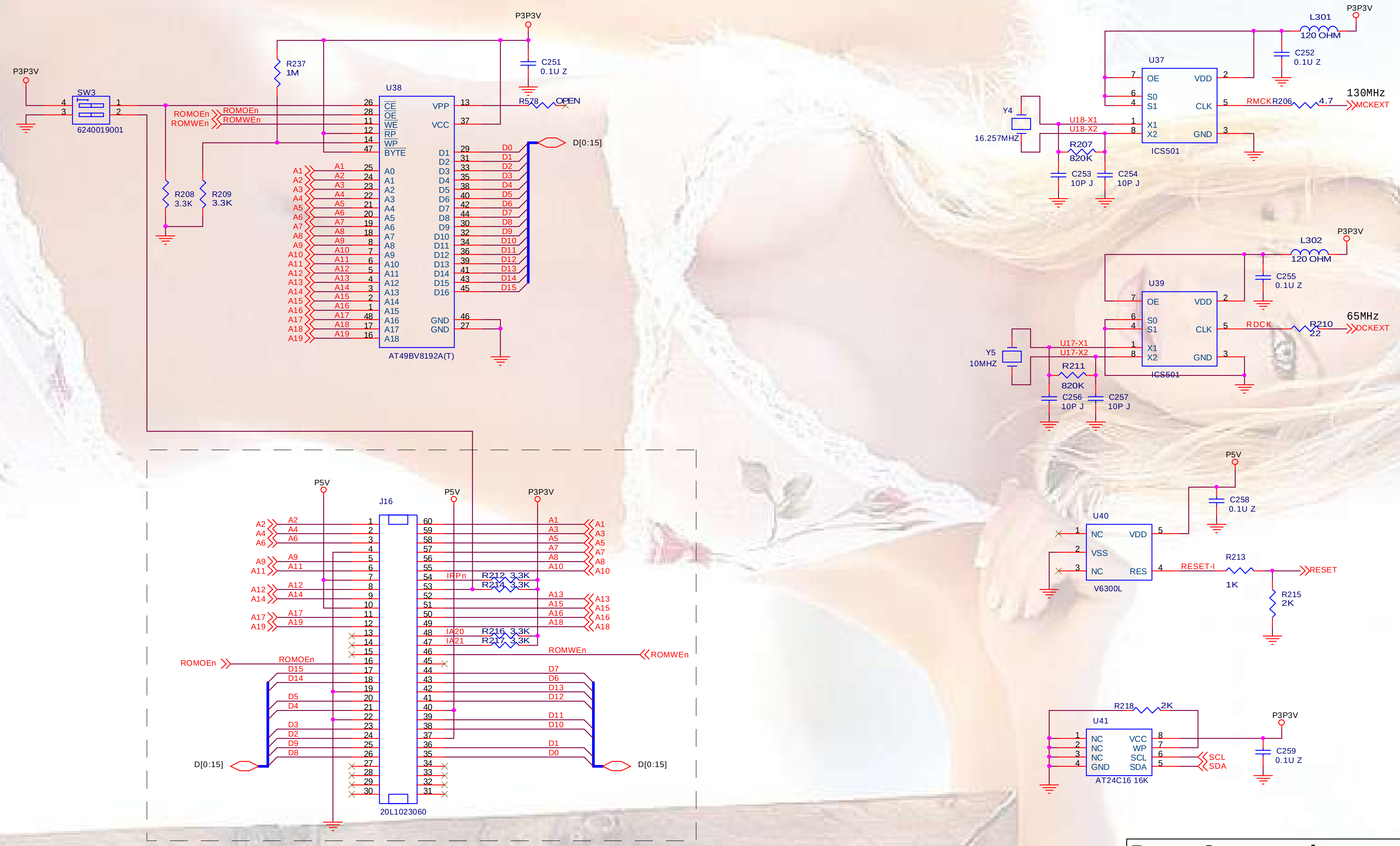
Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



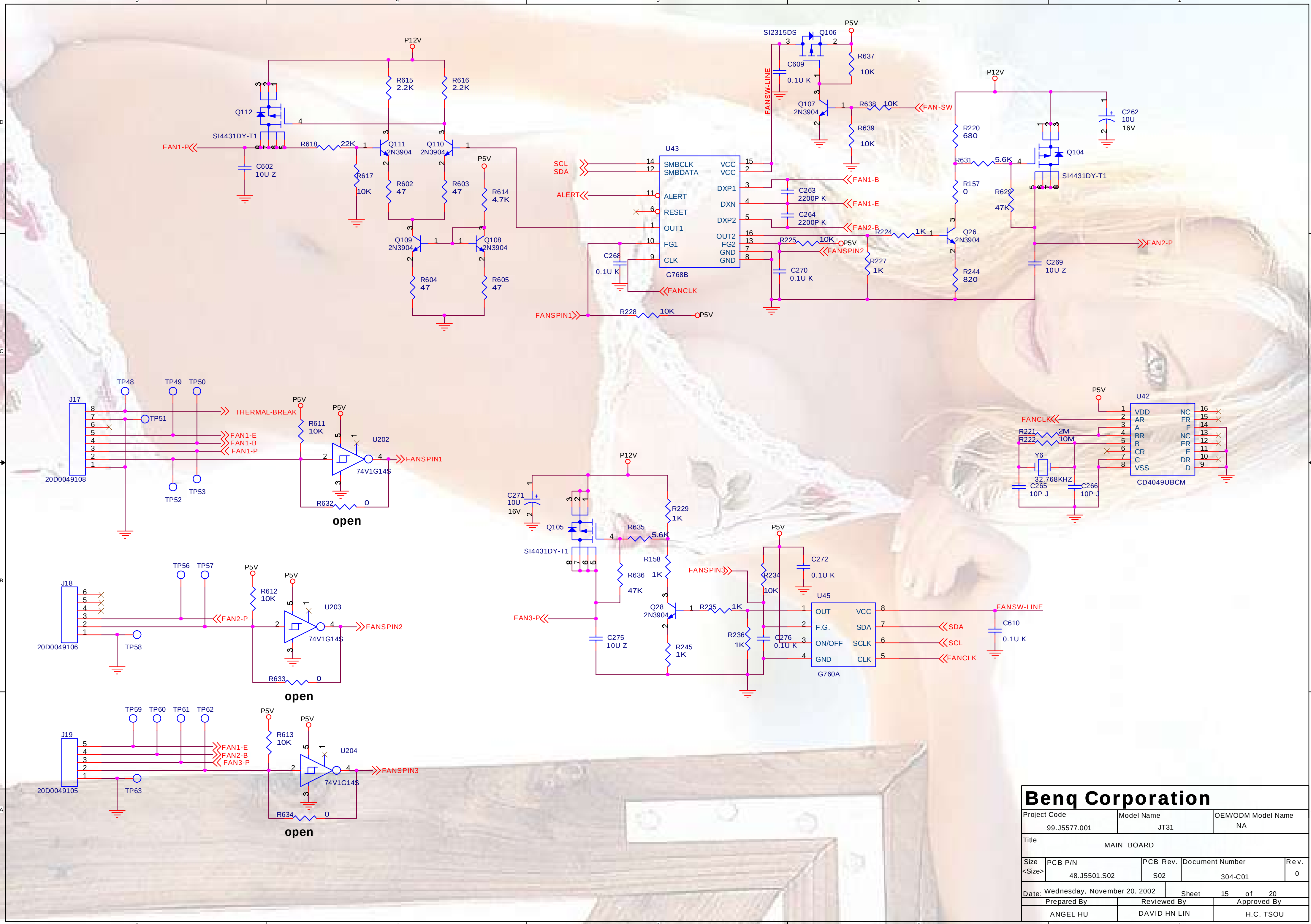
Benq Corporation				
Project Code: 99.J5577.001	Model Name: JT31		OEM/ODM Model Name: NA	
Title: MAIN BOARD				
Size: <Size>	PCB P/N: 48.J5501.S02	PCB Rev.: S02	Document Number: 304-C01	Rev.: 0
Date: Wednesday, November 20, 2002			Sheet 12 of 20	
Prepared By: ANGEL HU	Reviewed By: DAVID HN LIN		Approved By: H.C. TSOU	



Benq Corporation		
Project Code: 99.J5577.001	Model Name: JT31	OEM/ODM Model Name: NA
Title: MAIN BOARD		
Size: <Size>	PCB P/N: 48.J5501.S02	PCB Rev.: S02
Document Number: 304-C01	Rev.: 0	
Date: Wednesday, November 20, 2002	Sheet 13 of 20	
Prepared By: ANGEL HU	Reviewed By: DAVID HN LIN	Approved By: H.C. TSOU



Benq Corporation				
Project Code: 99.J5577.001	Model Name: JT31	OEM/ODM Model Name: NA		
Title: MAIN BOARD				
Size: <Size>	PCB P/N: 48.J5501.S02	PCB Rev.: S02	Document Number: 304-C01	Rev.: 0
Date: Wednesday, November 20, 2002		Sheet 14 of 20		
Prepared By: ANGEL HU	Reviewed By: DAVID HN LIN	Approved By: H.C. TSOU		



Benq Corporation

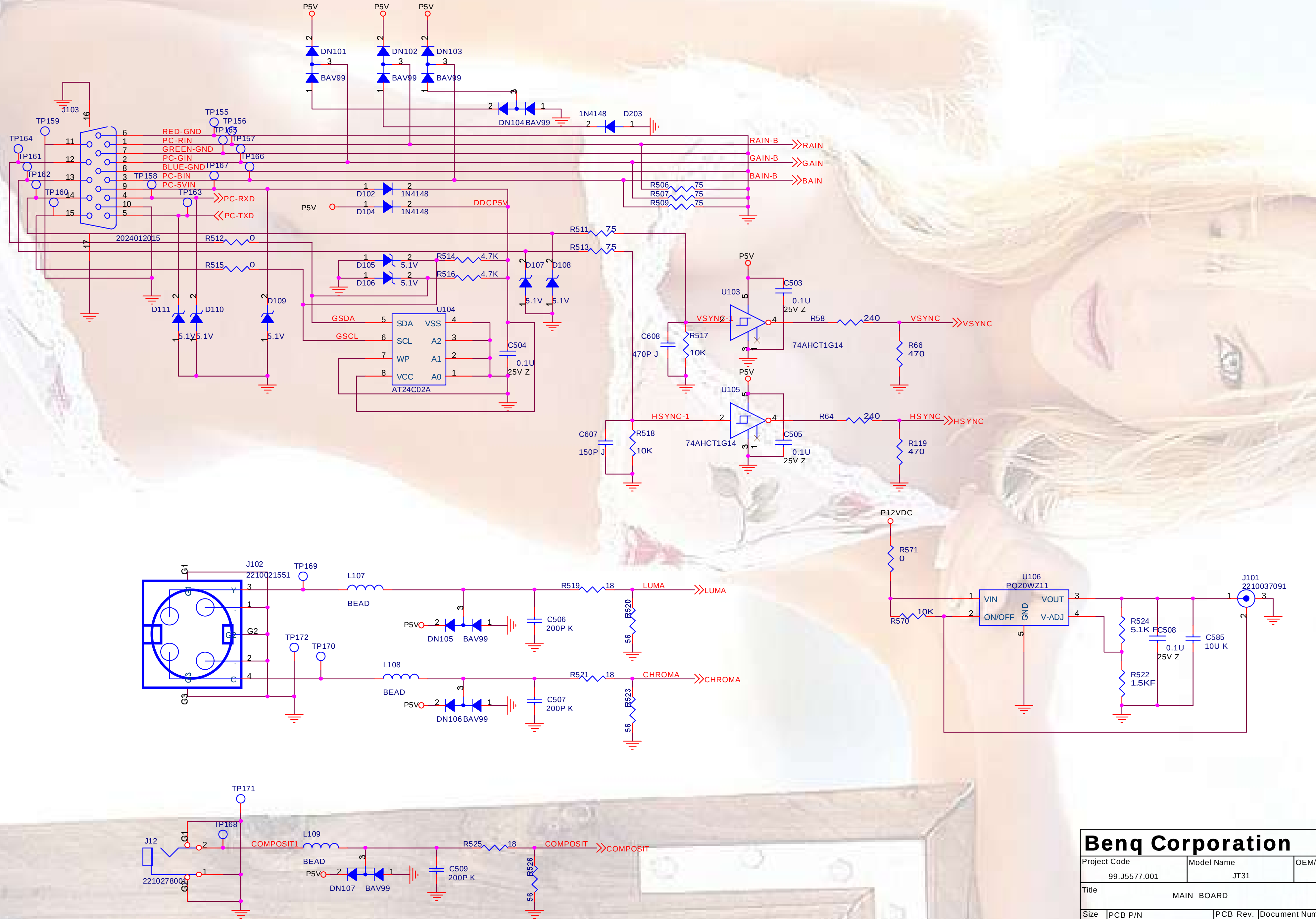
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

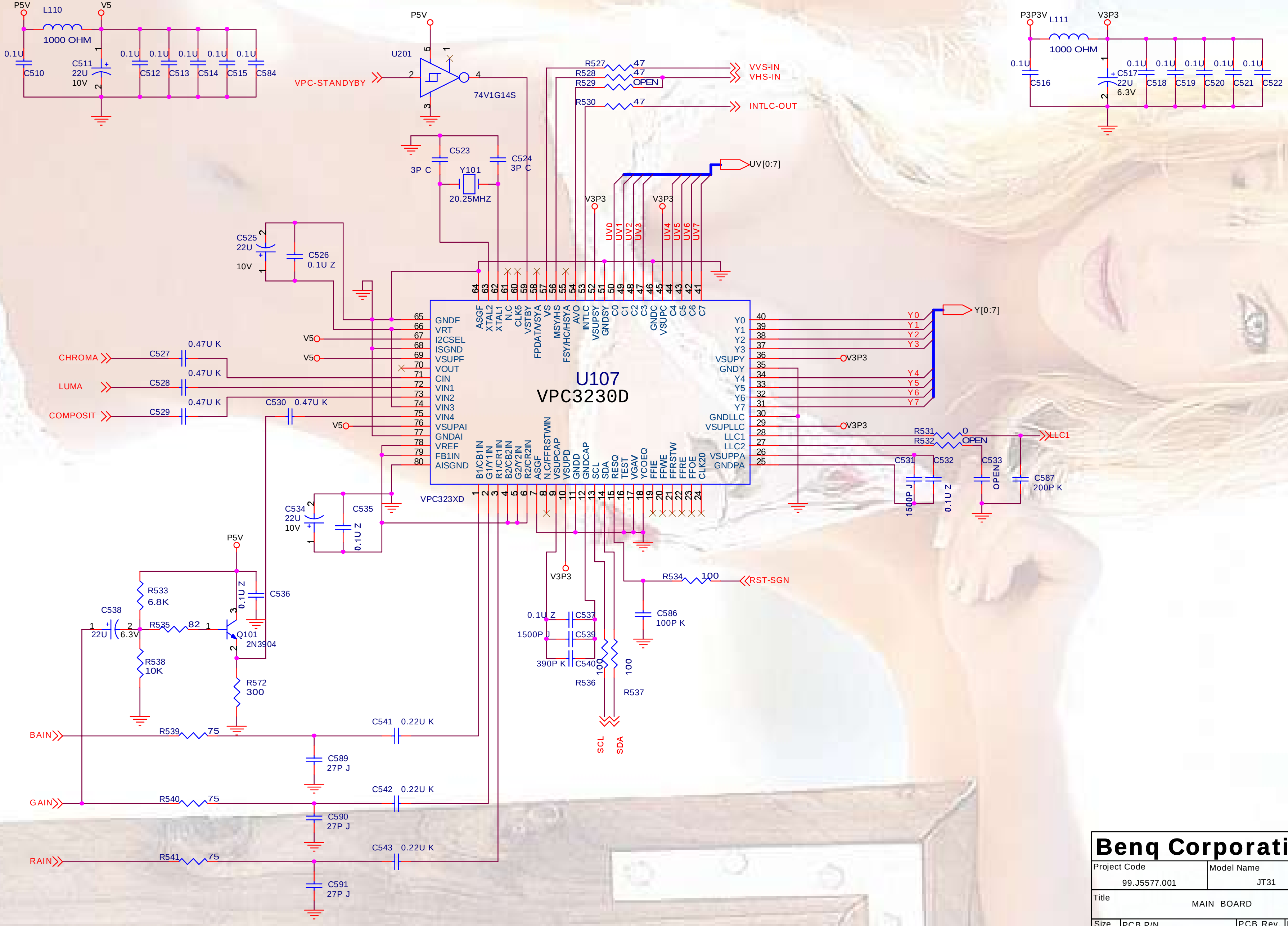
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Date: Wednesday, November 20, 2002 — Sheet 15 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation		
Project Code 99.J5577.001	Model Name JT31	OEM/ODM Model Name NA
Title MAIN BOARD		
Size <Size>	PCB P/N 48.J5501.S02	PCB Rev. S02
Document Number 304-C01	Rev. 0	
Date: Wednesday, November 20, 2002	Sheet 16 of 20	
Prepared By ANGEL HU	Reviewed By DAVID HN LIN	Approved By H.C. TSOU



Benq Corporation

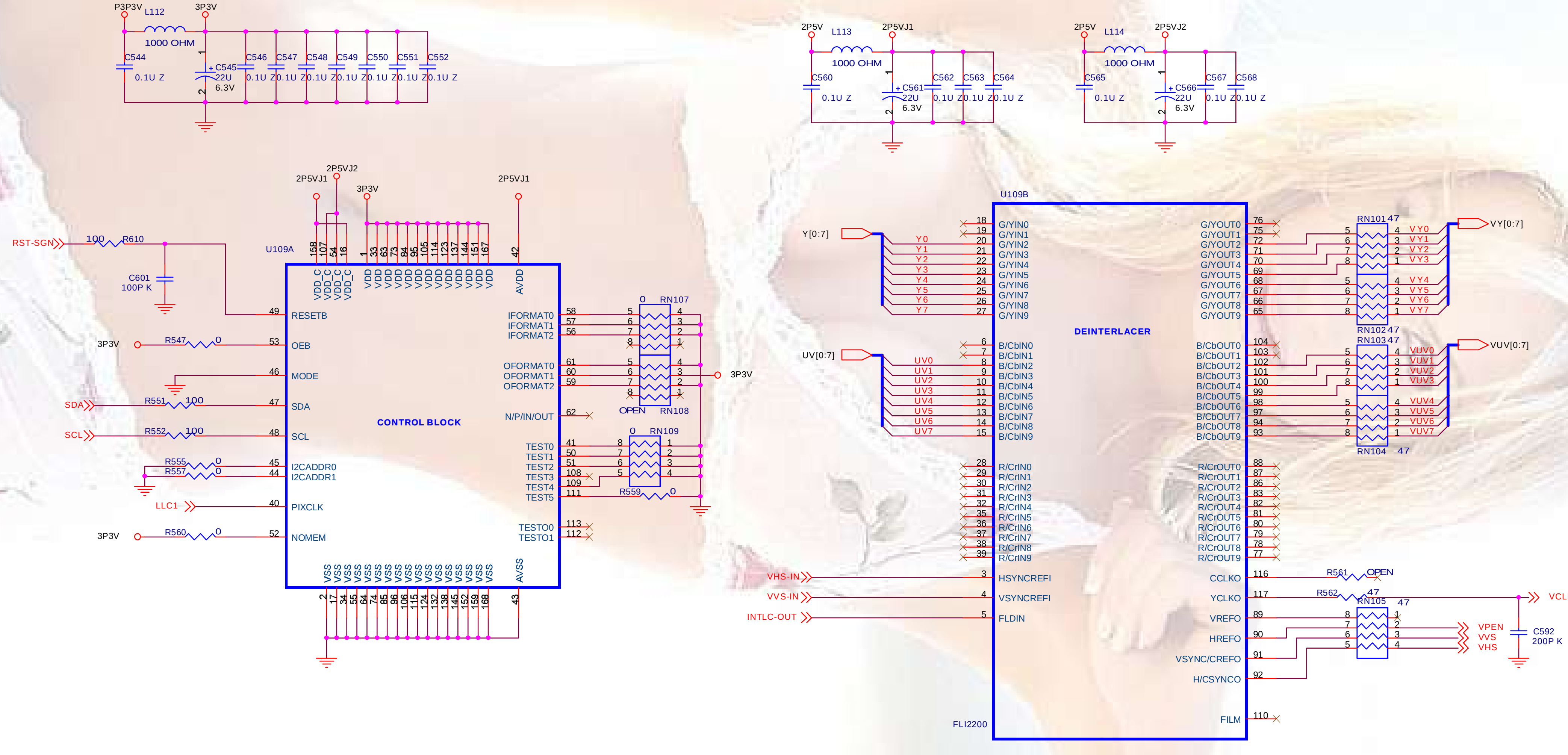
Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

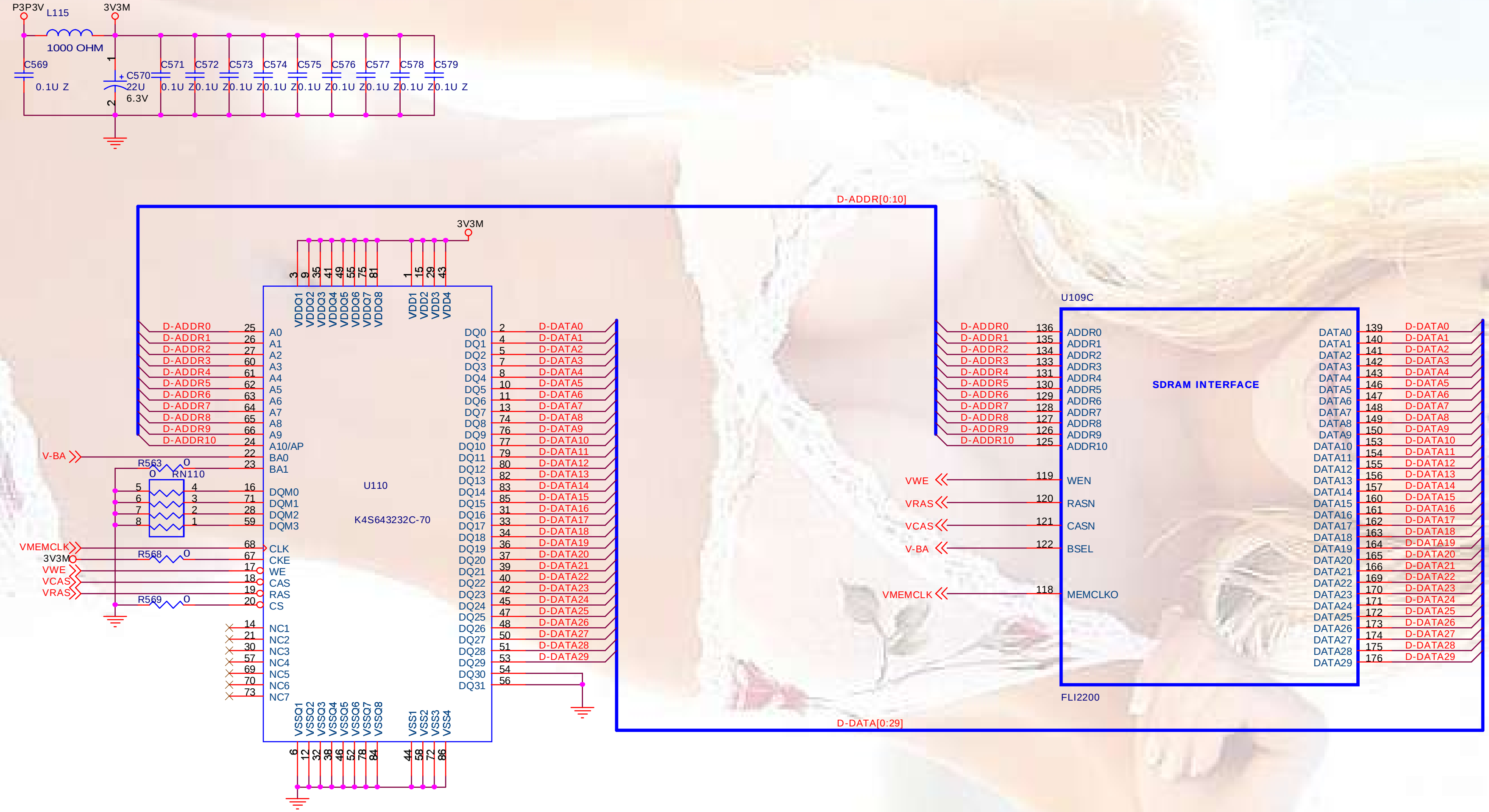
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Date: Wednesday, November 20, 2002 — Sheet 17 of 20

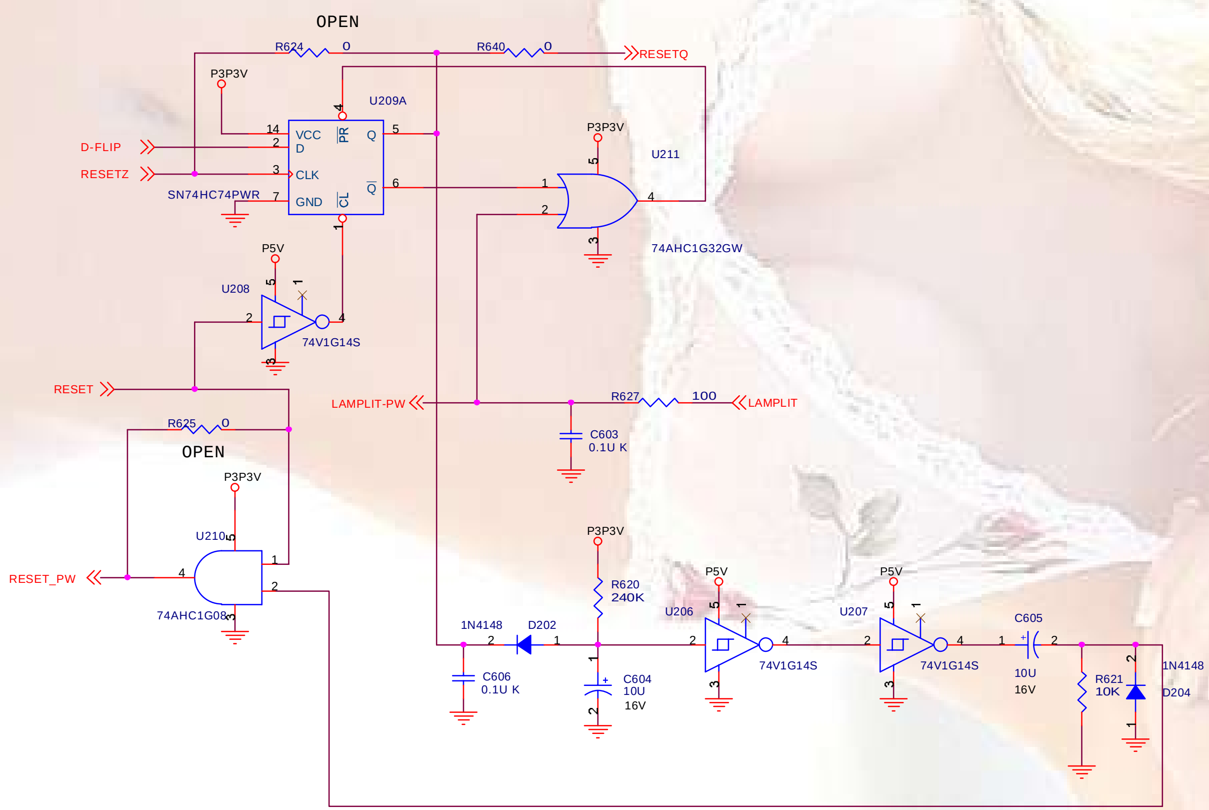
Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU



Benq Corporation		
Project Code 99.J5577.001	Model Name JT31	OEM/ODM Model Name NA
Title MAIN BOARD		
Size <Size> PCB P/N 48.J5501.S02	PCB Rev. S02	Document Number 304-C01 Rev. 0
Date: Wednesday, November 20, 2002		Sheet 18 of 20
Prepared By ANGEL HU	Reviewed By DAVID HN LIN	Approved By H.C. TSOU



Benq Corporation				
Project Code 99.J5577.001	Model Name JT31	OEM/ODM Model Name NA		
Title	MAIN BOARD			
Size <Size>	PCB P/N 48.J5501.S02	PCB Rev. S02	Document Number 304-C01	Rev. 0
Date: Wednesday, November 20, 2002		Sheet 19 of 20		
Prepared By ANGEL HU	Reviewed By DAVID HN LIN	Approved By H.C. TSOU		



Benq Corporation

Project Code	Model Name	OEM/ODM Model Name
99.J5577.001	JT31	NA

Title: MAIN BOARD

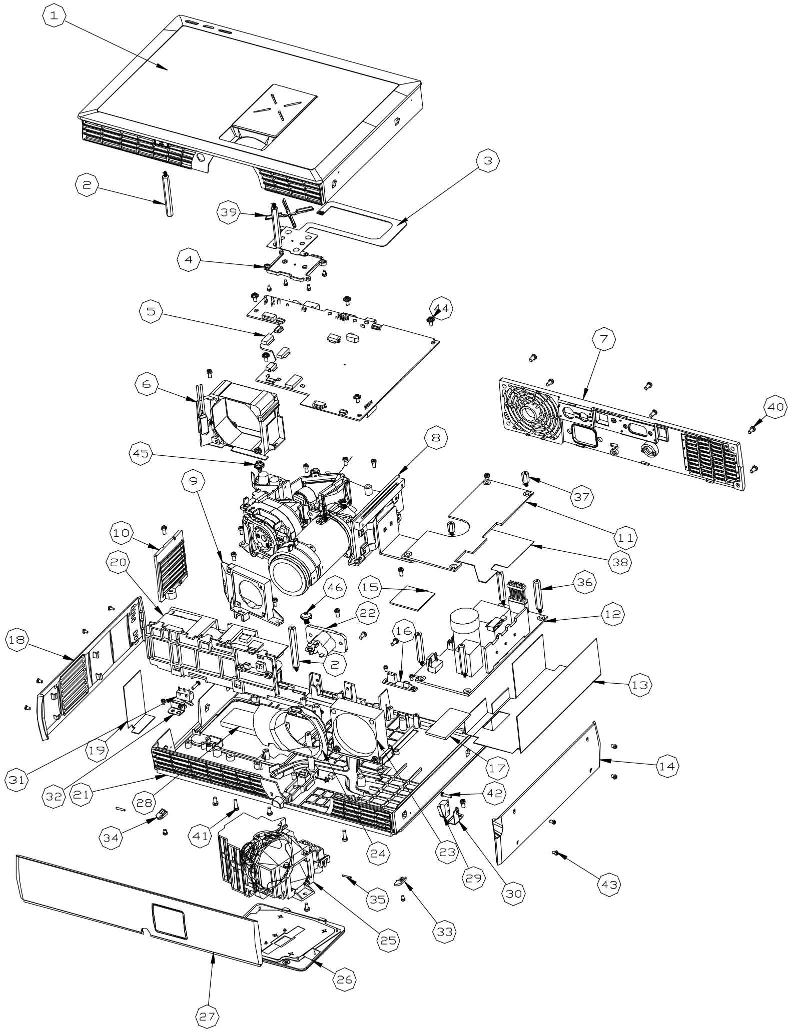
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Date: Wednesday, November 20, 2002 | Sheet 20 of 20

Prepared By	Reviewed By	Approved By
ANGEL HU	DAVID HN LIN	H.C. TSOU

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	91/11/23

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	60.J4905.011	ASSY UPPER CASE JT30	1	HOMARK
2	34.J4921.001	SPACER L39.5 M2.5 AL JT30	3	PSMPACIFIC
3	54.J4913.001	KEYPABD BD	1	BENQ
4	42.J4913.001	GUIDE KEYPAD ABS JT30	1	JIU BOR
5	55.J4901.001	MAIN BD	1	BENQ
6	60.J4904.001	ASSY LAMP FAN JT30	1	BENQ
7	60.J4906.001	ASSY REAR COVER JT30	1	SHANG BOR
8	60.J5577.L31	OPTICAL ENGINE	1	BENQ
9	60.J4903.001	ASSY BLOWER JT30	1	BENQ
10	42.J4936.001	LOUVER LIGHT LEAKAGE	1	JIU BOR
11	55.J4905.001	DC TO DC BD	1	BENQ
12	55.J4911.001	PFC BD	1	BENQ
13	42.J4933.001	MYLAR POWER BD PC JT30	1	GOLD SPEED
14	42.J4918.001	CVR LEFT ABS Y7006C JT30	1	SHANG BOR
15	42.J5501.001	THERMAL PAD DMD	1	APUS
16	55.J4908.001	FRONT IR BD	1	BENQ
17	42.J4941.001	THERMAL PAD POWER	1	APUS
18	42.J4919.001	CVR RIGHT ABS Y7006C JT30	1	SHANG BOR
19	42.J4934.001	MYLAR BALLAST BD PC JT30	1	GOLD SPEED
20	60.J4902.001	ASSY BALLAST JT30	1	BENQ
21	60.J4907.001	ASSY LOWER CASE JT30	1	HOMARK
22	60.J4917.001	ASSY AC SOCKET JT30	1	BENQ
23	60.J4915.001	ASSY POWER FAN JT30	1	BENQ
24	42.J4920.001	RING LENS FRONT PC JT30	1	JIU BOR
25	60.J4913.001	ASSY LAMP HLD	1	BENQ
26	60.J4908.001	ASSY LAMP DOOR JT30	1	JIU BOR
27	60.J4901.001	ASSY FRONT DOOR JT30	1	SHANG BOR
28	42.J5503.001	THERMAL PAD BALLAST	1	APUS
29	50.J4906.001	FRONT DOOR SWITCH	1	YUAN YUH
30	33.J4901.001	HLD DOOR SWITCH SECC0.6 JT30	1	SHIANG
31	50.J4905.001	LAMP DOOR SWITCH	1	YUAN YUH
32	33.J3404.001	HOLDER LAMP DOOR	1	SHIANG
33	33.J4909.001	CVR HINGE RIGHT MG Y8006B JT30	1	HOMARK
34	33.J4908.001	CVR HINGE LEFT MG Y8006B JT30	1	HOMARK
35	34.J4917.001	PIN FRONT DOOR JT30	2	SHIANG
36	34.J4922.001	SPACER L27.5 M2.5 AL JT30	4	PSMPACIFIC
37	34.J4923.001	SPACER L8.8 M2.5 AL JT30	2	PSMPACIFIC
38	42.J4938.001	MYLAR DC TO DC BD JT30	1	GOLD SPEED
39	42.J4911.001	BTN OSD ABS JT30	1	JIU BOR
40	86.1A323.5R0	SCRW MACH PAN M2.5*5L B-ZN	23	HNS
41	86.1A323.8R0	SCRW MACH PAN M2.5*8L B-ZN	2	HNS
42	86.VA522.8R0	SCRW TAP PAN M2*8L NI	2	HNS
43	86.1A322.3R0	SCREW MACH PAN M2*3L B-ZN	15	HNS
44	86.1G523.5R0	SCRW MACH PH W/FL M2.5*5L NI	5	HNS
45	86.VG524.5R0	SCRW TAP PH W/FLA M3*5L NI	1	HNS
46	86.00010.161	SCRW TAPTITE TRS W/WSHR M4*12L	1	HNS



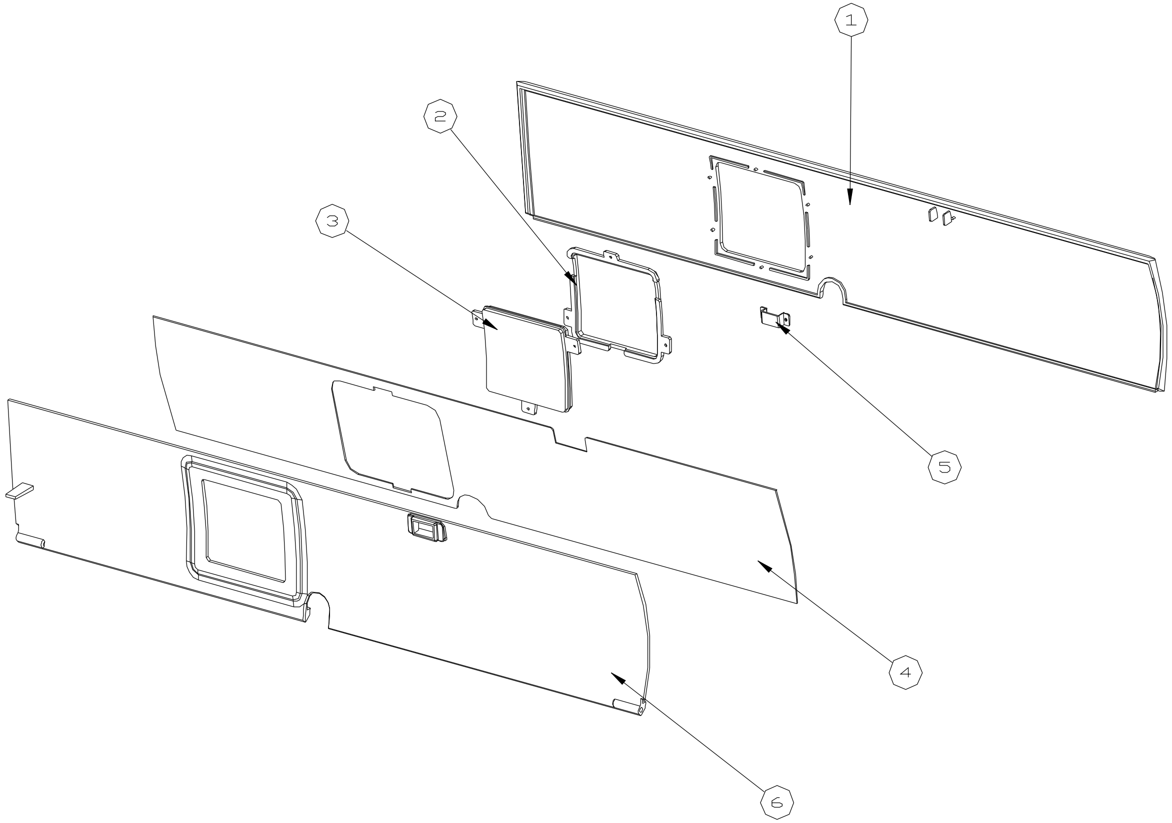
MODEL	JT31		NAME ASSY DUMMY CASE			
DRN	JACK LIU	91/11/23	MATERIAL			
DSN	JACK LIU	91/11/23	FINISH			
CKD	ALEX WJ HO	91/11/23	SCALE	1 /	DIM IN	mm
APPD	CHRIS LI	91/11/23	SHEET	1OF1	CAVITIES	

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	99.J5577.L31						

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19

ITEM	P/N	DESCRIPTION	Q'TY	Vendor
1	42.J4901.011	FRT DOOR OUT PCABS Y7006C JT31	1	SHANG BOR
2	42.J4902.001	FRT DOOR RING ABS DIC546 JT30	1	SHANG BOR
3	42.J4903.001	FRT DOOR WINDOW PMMA JT30	1	SHANG BOR
4	47.J4907.001	SPONGE TAPE 0.4MM JT30	1	SPEED GOLDEN
5	34.J4913.001	PLATE MAGNET SECC0.4 JT30	1	SHIANG
6	31.J4903.001	FRT DOOR PLT MG Y7005B JT30	1	GATETECH



SCALE 1.000

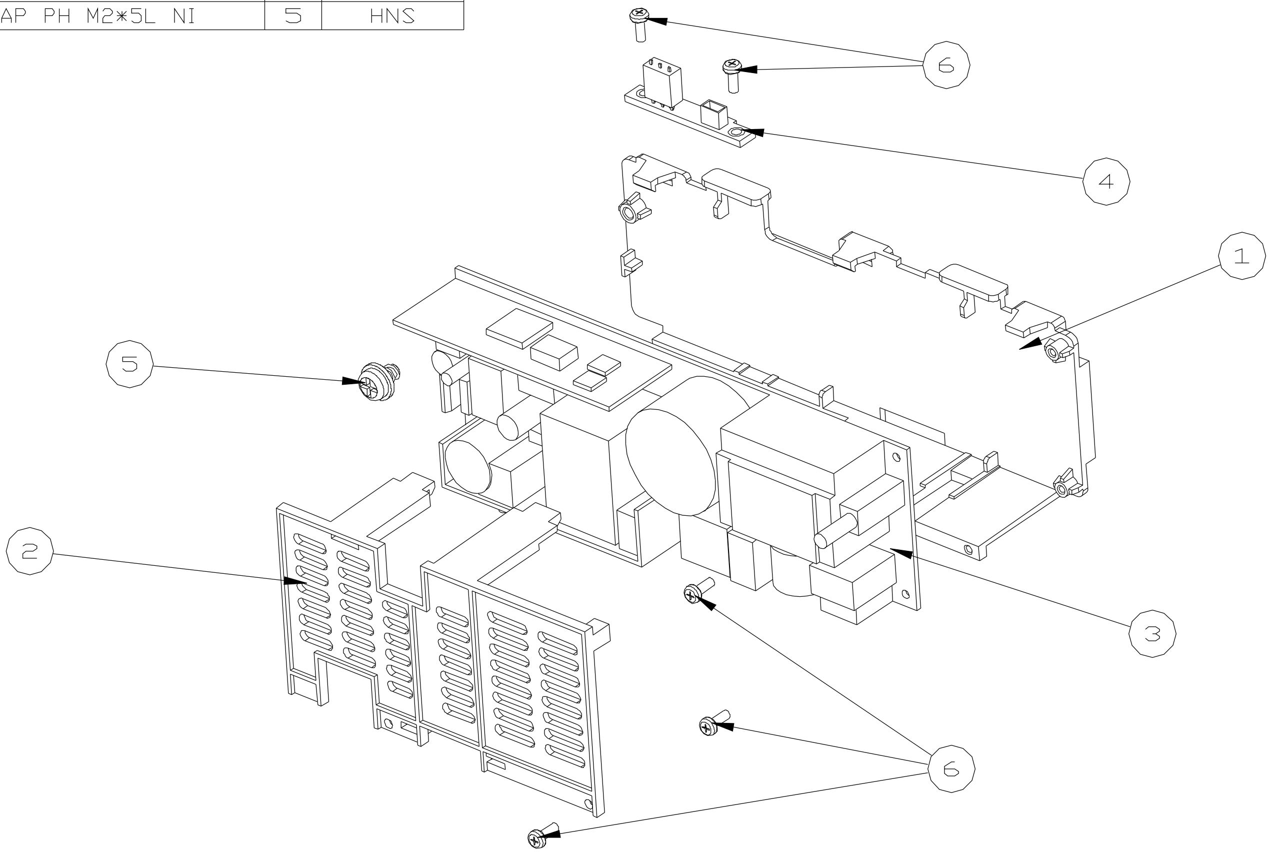
MODEL	JT31		NAME ASSY FRONT DOOR			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	
BenQ Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4901.011						

F

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	42.J4904.001	BRACKET BALLAST PC JT30	1	SHANG BOR
2	42.J4905.001	COVER BALLAST PC JT30	1	SHANG BOR
3	54.J4912.001	BALLAST BD	1	USHIO
4	55.J4908.001	FRONT IR BD	1	BENQ
5	86.VG524.5R0	SCRW TAP PH W/FLA M3*5L NI	1	HNS
6	86.VA512.5R0	SCRW TAP PH M2*5L NI	5	HNS

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19



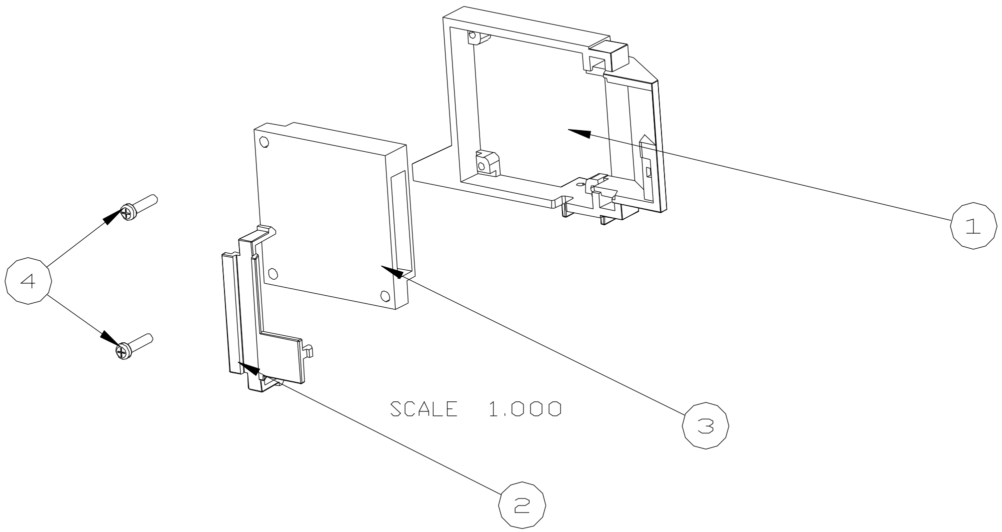
SCALE 1.000

MODEL	JT30		NAME ASSY BALLAST			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	
Benq Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4902.001						

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	42.J4906.001	BRACKET BLOWER PPS JT30	1	JIUBOR
2	42.J4909.001	COVER BLOWER PPS JT30	1	SHANG BOR
3	23.10094.001	BLOWER	1	ADDA
4	86.VA522.8R0	SCREW TAP PAN M2*8L NI	2	HNS

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19



SCALE 1.000

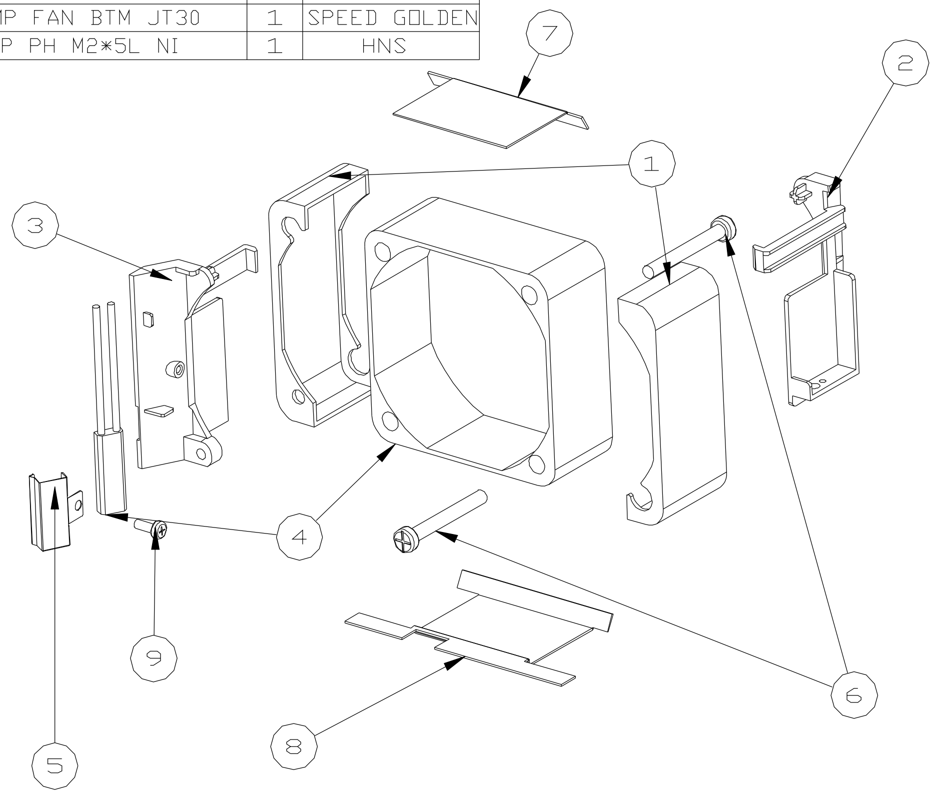
MODEL	JT30		NAME ASSY BLOWER		
DRN	JACK LIU	2002/11/19	MATERIAL		
DSN	JACK LIU	2002/11/19	FINISH		
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES

BenQ Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4903.001						

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	47.J4901.001	CUSHION LAMP FAN JT30	2	SPEED GOLDEN
2	42.J4907.001	HOLDER OUTLET PC JT30	1	SHANG BOR
3	42.J4908.001	HOLDER INLET PC JT30	1	SHANG BOR
4	60.J4978.001	ASSY LAMP FAN	1	EVER SMILING
5	33.J4902.001	HLD THERM BREAKER SPTE0.2 JT30	1	SHIANG
6	86.VA324.250	SCREW TAP PAN M3*25L B-ZN	2	HNS
7	42.J4939.001	MYLAR LAMP FAN TOP JT30	1	SPEED GOLDEN
8	42.J4940.001	MYLAR LAMP FAN BTM JT30	1	SPEED GOLDEN
9	86.VA512.5R0	SCRW TAP PH M2*5L NI	1	HNS

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19



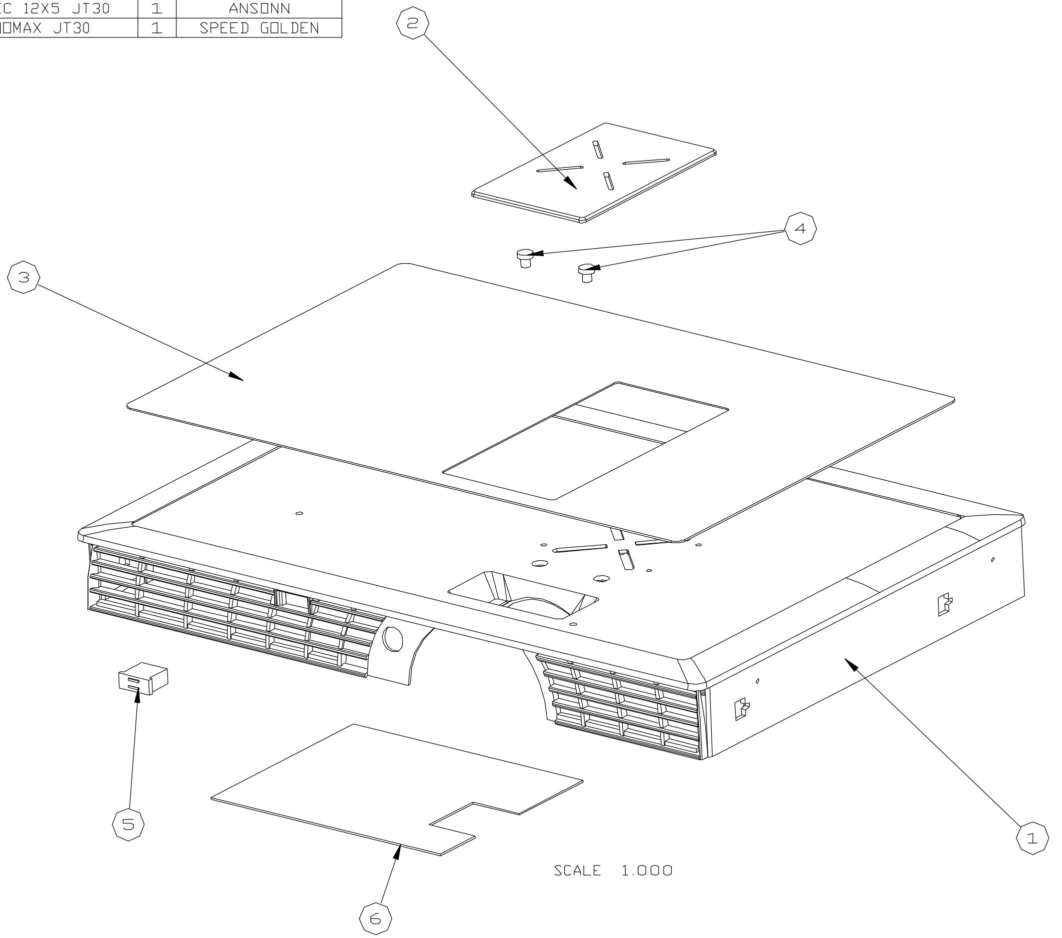
MODEL	JT30		NAME ASSY LAMP FAN			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	
BenQ Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4904.001						

Form No: ACM0-0B-003-24 (010918)

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	30.J4901.001	UPPER CASE MG Y8006B JT30	1	HOMARK
2	42.J4910.011	MIRROR HALF PC JT31	1	JIUBOR
3	31.J4904.011	PLATE UPPER CASE AL JT31	1	CS
4	42.J4912.001	LENS OSD PC JT30	2	JIUBOR
5	65.J4906.001	CATCH MAGNETIC 12X5 JT30	1	ANSONN
6	42.J4937.001	MYLAR U/C NOMAX JT30	1	SPEED GOLDEN



SCALE 1.000

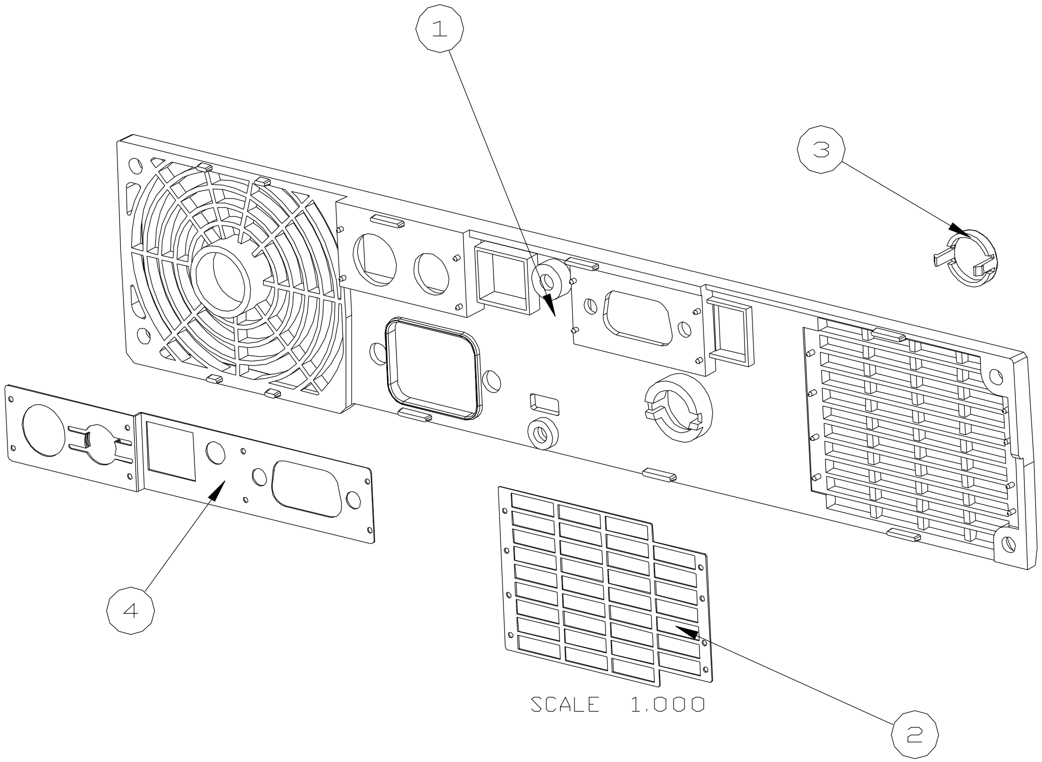
MODEL	JT31		NAME ASSY UPPER CASE			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	

BenQ Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.4905.011						

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	39.J4901.001	REAR CASE PC JT31	1	SHANG BOR
2	31.J4906.001	MESH REAR CASE SPTE JT30	1	CS
3	42.J4914.001	LENS REAR IR PC JT30	1	JIUBOR
4	31.J4907.001	SHIELDING CNTOR SPTE JT30	1	SHIANG

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19



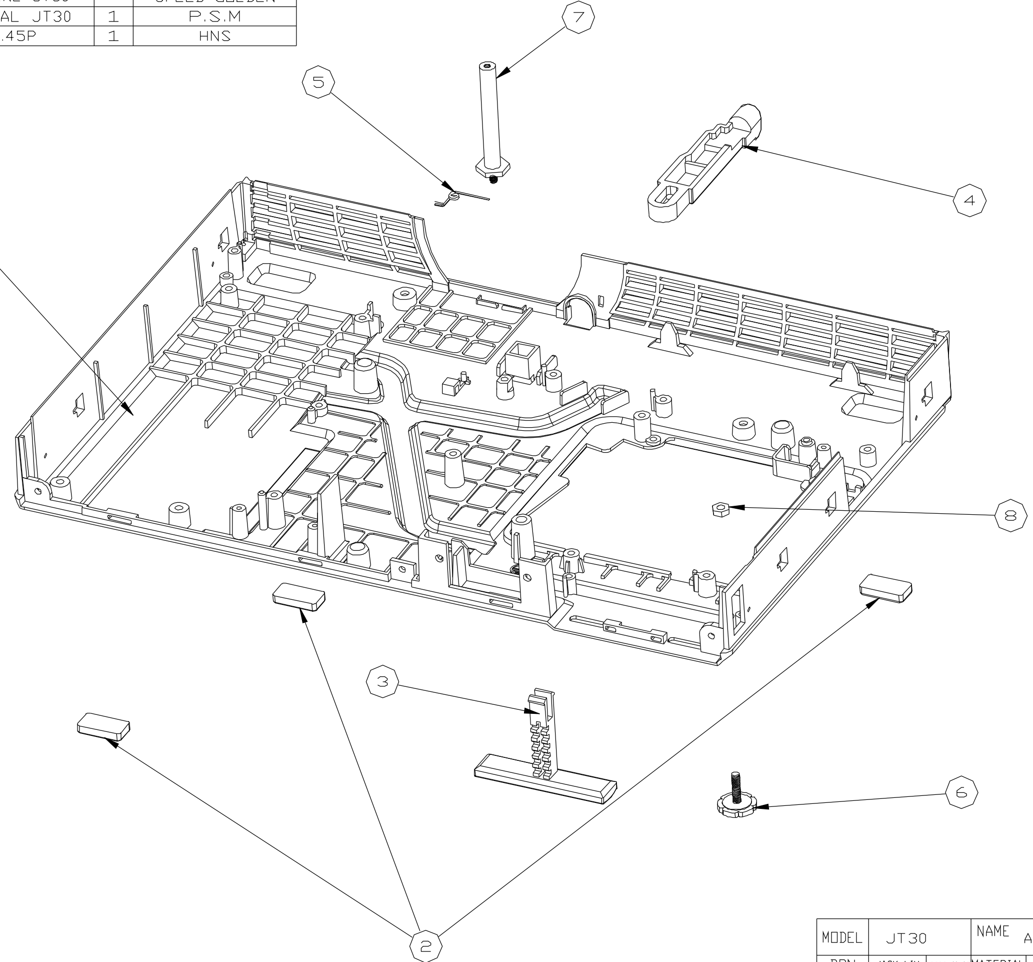
MODEL	JT30		NAME ASSY REAR COVER			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4906.001						

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	30.J4902.001	LOWER CASE MG Y8006B JT30	1	HOMARK
2	47.J4902.001	RUBBER FOOT NEOPRENE JT30	3	SPEED GOLDEN
3	42.J4915.001	FOOT ADJUST PC Y7006C JT30	1	JIUBOR
4	42.J4916.001	BTN FOOT PC Y7006C JT30	1	JIUBOR
5	34.J4901.001	SPRING ADJUST FOOT SUS301 JT30	1	SHIANG
6	47.J4903.001	LEVELER BACK NEOPRENE JT30	1	SPEED GOLDEN
7	34.J4920.001	SPACER L37.5 M2.5 AL JT30	1	P.S.M
8	87.11212.320	NUT HEX M2.5*0.45P	1	HNS

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19



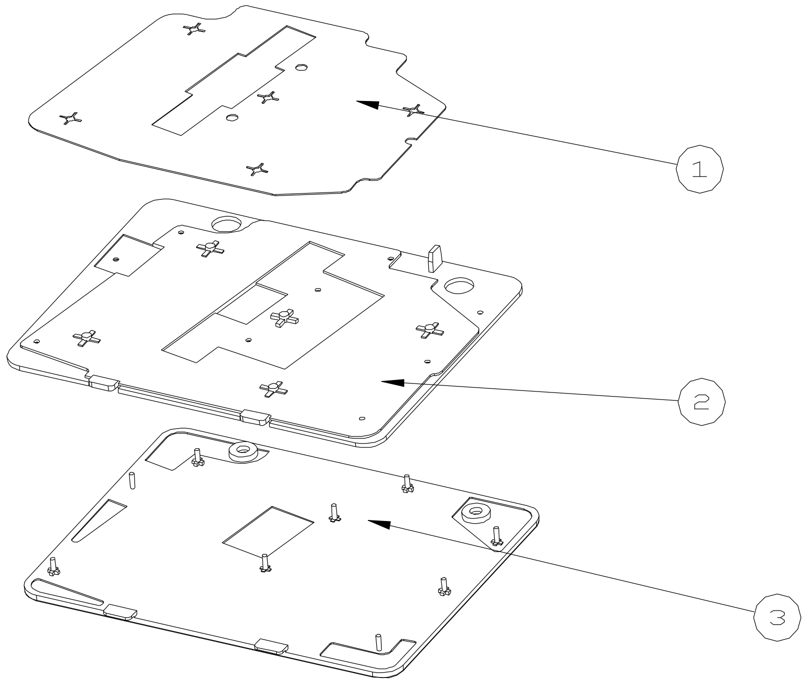
MODEL	JT30		NAME ASSY LOWER CASE			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	
BenQ Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)

CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4907.001						

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	34.J4914.001	PLATE LAMP AL0.3 JT30	1	SHIANG
2	31.J4905.001	DOOR LAMP MG JT30	1	HOMARK
3	42.J4935.001	COVER LAMP PCABS Y8006C JT30	1	JIUBOR

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19



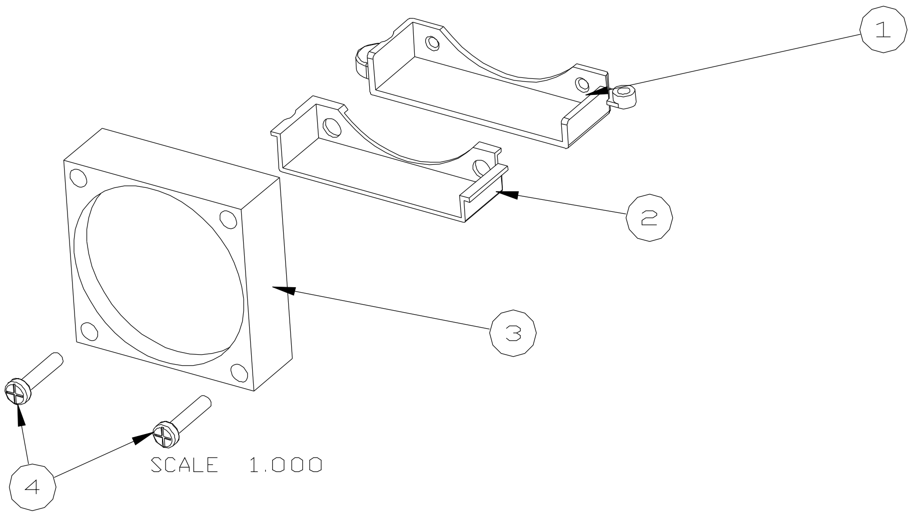
SCALE 1.000

MODEL	JT30		NAME ASSY LAMP DOOR			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	
BenQ Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4908.001						

ITEM	P/N	DESCRIPTION	Q'TY	VENDOR
1	42.J4917.001	HLD POWER FAN PC JT30	1	JIUBOR
2	47.J4904.001	RUBBER POWER FAN JT30	1	SPEED GOLDEN
3	23.10095.001	POWER FAN	1	ADDA
4	86.VA524.140	SCRW TAP RAN M3*14L 2LEAD NI	2	HNS

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			JACK LIU	2002/11/19

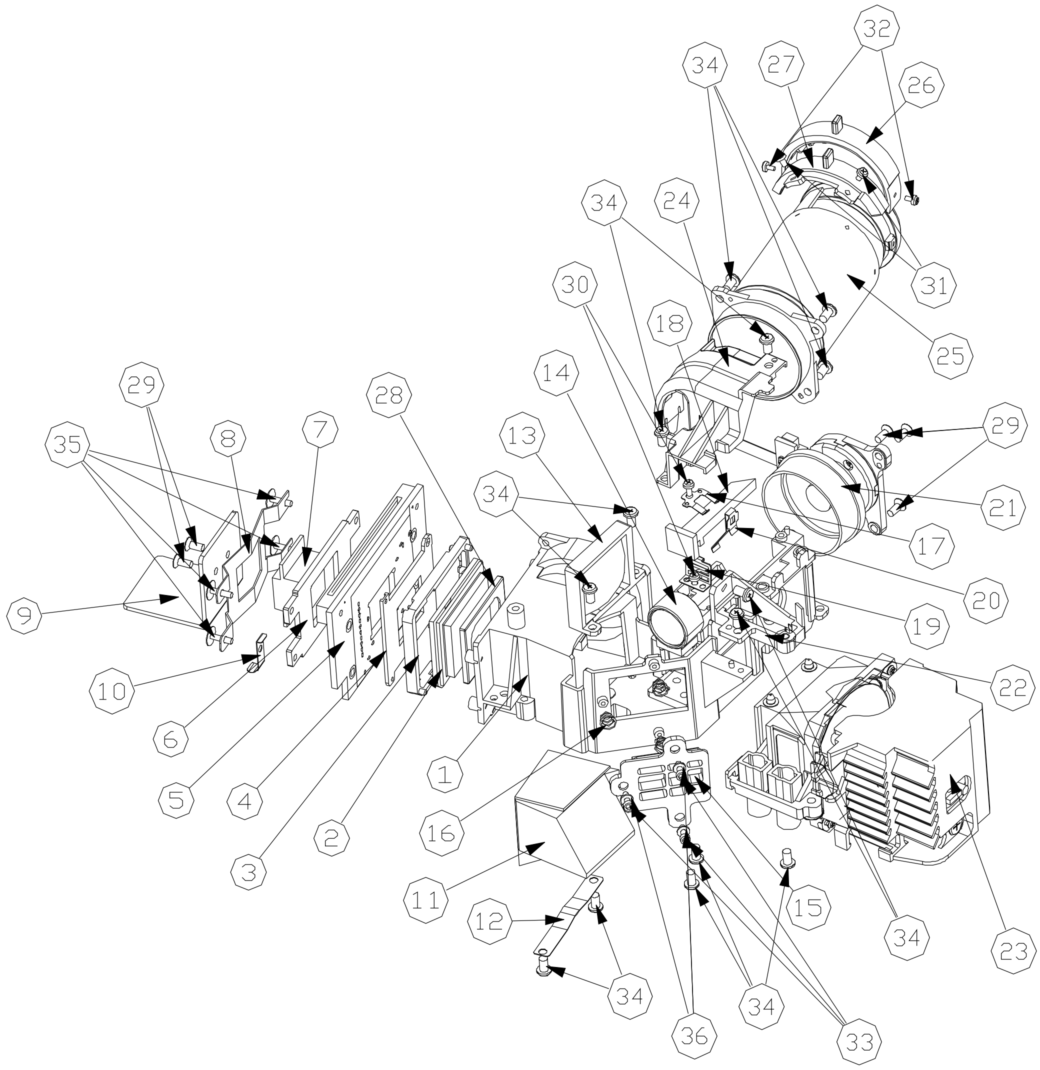


MODEL	JT30		NAME ASSY POWER FAN			
DRN	JACK LIU	2002/11/19	MATERIAL			
DSN	JACK LIU	2002/11/19	FINISH			
CKD	ALEX WJ HO	2002/11/19	SCALE	1:1	DIM IN	mm
APPD	CHRIS LI	2002/11/19	SHEET	1 OF 1	CAVITIES	

BenQ Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4915.001						

PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021127



MODEL	JT31		NAME ASSY ENG MODULE JT31			
DRN	DAVID WONG	021127	MATERIAL	NA		
DSN	DAVID WONG	021120	FINISH			
CKD	JIMMY SHEN	021122	SCALE	1 /	DIM IN	mm
APPD	CJHRIS LI	021122	SHEET	1 OF 2	CAVITIES	

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J5577.L31						

PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021127

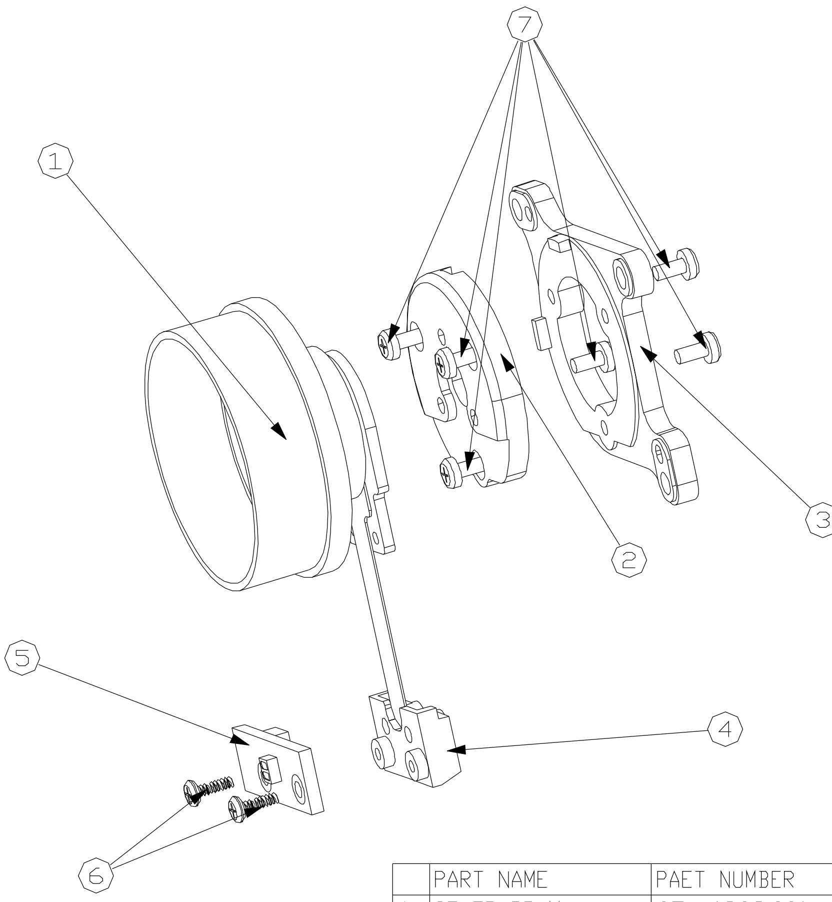
	PART NAME	PART NUMBER	Qty
1	DMD HSG JT31	33.J5501.001	1
2	DMD CHIP	71.08060.000	1
3	DMD HOLDER	42.J4922.001	1
4	SUB ASS HSG CONTACT	65.J1702.001	1
5	CHIP BOARD	55.J4906.001	1
6	PLT BD DMD	31.J4901.001	1
7	H BLOCK DMD	34.J4919.001	1
8	CLIP BD DMD	34.J4904.001	1
9	H SINK DMD	34.J4906.001	1
10	CLIP EMI DMD	34.J4926.001	1
11	TIR PRISM	65.J4903.001	1
12	CLIP TIR	34.J4903.001	1
13	ASSY LENSC3 MODULE	60.J4918.001	1
14	ASSY C1C2 MODULE	60.J4910.001	1
15	ASSY FM MODULE	60.J4911.001	1
16	SPRING FM	34.J4924.001	3
17	CLIP ROD SIDE	34.J4918.001	1
18	ROD	35.J8049.021	1
19	CLIP ROD BTM	34.J4904.001	1
20	CLIP ROD TOP	34.J4902.001	1
21	ASSY COLOR DRUM	60.J4909.001	1
22	HOLD BALLAST CONN	42.J4930.001	1
23	ASSY LAMP MODULE	60.J4912.001	1
24	CVR COLOR DRUM	42.J4921.001	1
25	ZOOM LENS	65.J4901.001	1
26	RING FOCUS	42.J4928.001	1
27	RING ZOOM	42.J4927.001	1
28	RUBBER DUST SHIELD	47.J4905.001	1
29	SCRW M2.5*6L	86.5A253.6R0	5
30	SCRW M2*4 NYL	86.1A352.4R0	2
31	SCRW M2*3	86.1A322.3R0	2
32	SCRW M2*4 TAP	86.VA52M.4R0	2
33	SCRW M2*6	86.2R322.6R0	3
34	SCRW M2.5*5	86.1A323.5R0	15
35	SCRW M2*8 CAP	86.1G522.8R0	4
36	WASHER M2	88.15301.205	3

MODEL	JT31		NAME	ASSY EMG MODULE JT31		
DRN	DAVID WONG	021105	MATERIAL	NA		
DSN	DAVID WONG	021120	FINISH			
CKD	JIMMY SHEN	021122	SCALE	1 /	DIM IN	mm
APPD	CJHRIS LI	021122	SHEET	2 OF 2	CAVITIES	

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J5577.L31						

PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021126



	PART NAME	PAET NUMBER	Qty
1	COLOR DRUM	65.J4902.001	1
2	CUSHION COLOR DRUM	47.J4906.001	1
3	BKT MOTOR MOUNT	33.J4912.001	1
4	HLD SENSOR BD	42.J4923.001	1
5	SENSOR BOARD	55.J4922.001	1
6	SCRW M2*5L TAP	86.VA512.5R0	2
7	SCRW NM2*4L NYL	86.1A352.4R0	6

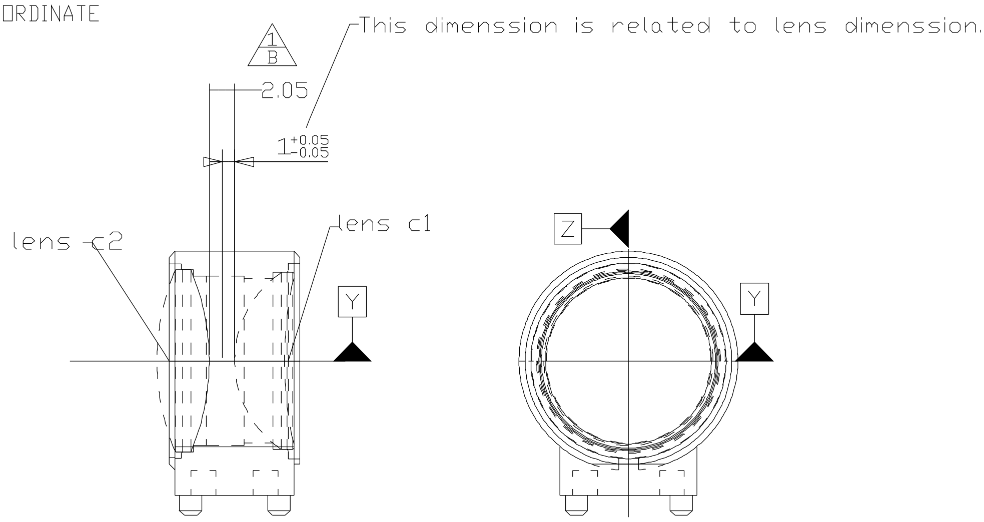
MODEL	JT30		NAME ASSY COLOR DRUM		
DRN	DAVID WONG	021105	MATERIAL	NA	
DSN	DAVID WONG	021105	FINISH		
CKD	JIMMY SHEN	021108	SCALE	1 /	DIM IN mm
APPD	CJHRIS LI	021109	SHEET	OF	CAVITIES

Benq Corporation

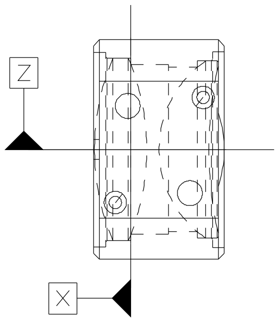
TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4909.001						

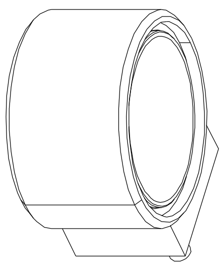
PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	020828
	B		1 ---->2.05			DAVID WONG	021003

LENS C2 CORDINATE



PART NAME	PART NUMBER
LENS C1	35.80J49.001
LENS C2	35.80J49.031

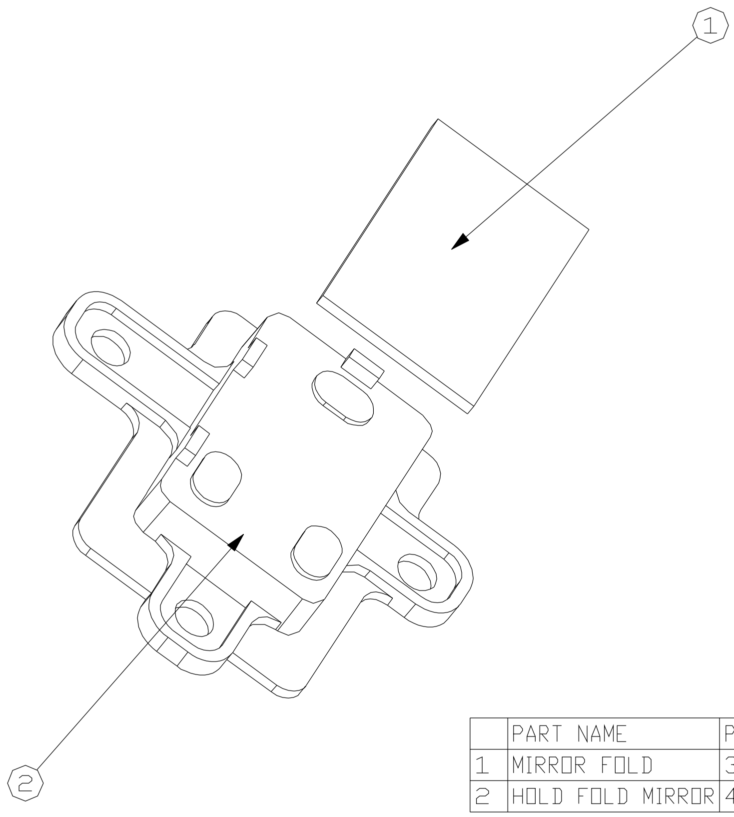




MODEL	JT30		ASSY LENS C1, C2			
DRN	DAVID WONG	020805	MATERIAL			
DSN	DAVID WONG	020806	FINISH			
CKD	JIMMY SHEN	020815	SCALE	1 /	DIM IN	mm
APPD	CHRIS LI	020816	SHEET	OF	CAVITIES	
Benq Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4910.001						

PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021126



	PART NAME	PART NUMBER	Qty
1	MIRROR FOLD	35.70J49.001	1
2	HOLD FOLD MIRROR	42.J4924.001	1

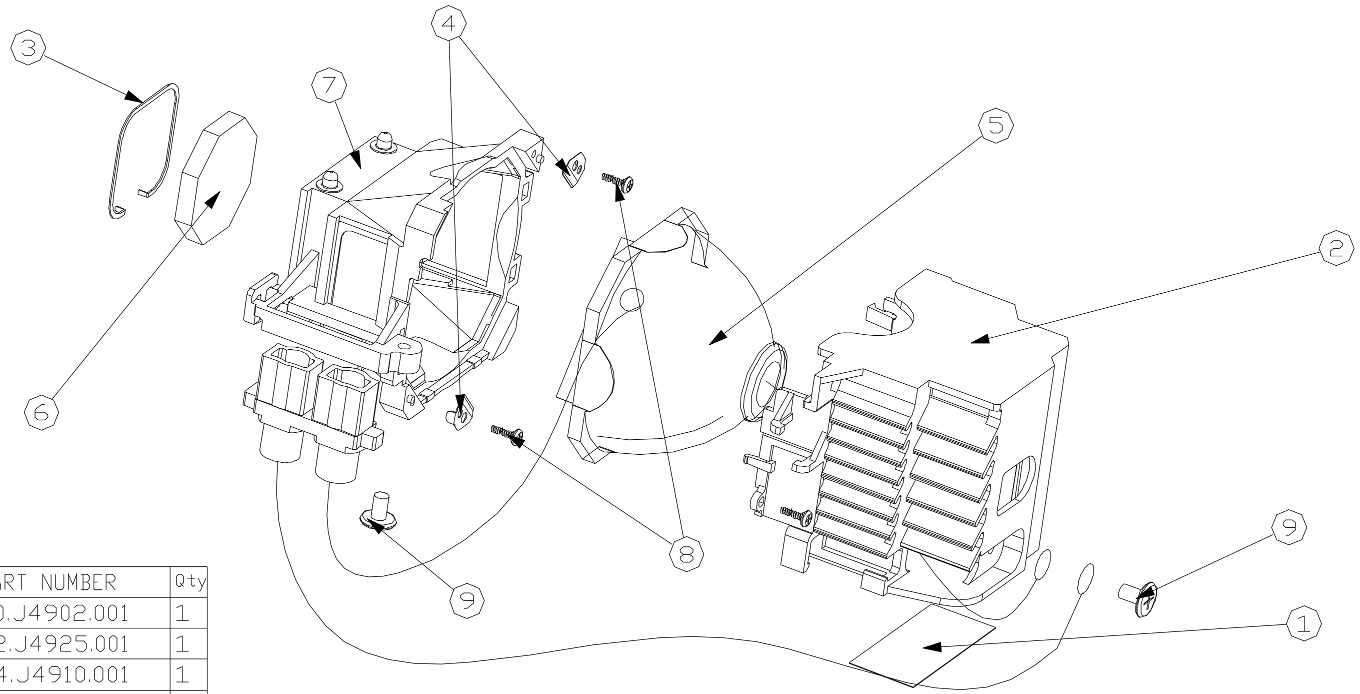
*note
Part 1 is fixed on Part 2 by glue 38.01044.001 and 38.03026.001

MODEL	JT30		NAME ASSY FOLD MIRROR		
DRN	DAVID WONG	021105	MATERIAL	NA	
DSN	DAVID WONG	021105	FINISH		
CKD	JIMMY SHEN	021108	SCALE	1 /	DIM IN mm
APPD	CJHRIS LI	021110	SHEET	OF	CAVITIES

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4911.001						

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021126



	PART NAME	PART NUMBER	Qty
1	label lamp	40.J4902.001	1
2	Cvr Lamp Hld	42.J4925.001	1
3	Clip FG	34.J4910.001	1
4	Clip Lamp Hld	34.J4911.001	2
5	Lamp USHIO	65.J4904.001	1
6	F- Glass	35.81J49.001	1
7	Assy Lamp Hld	60.J4913.001	1
8	SCRW M2*5L TAP	86.VA512.5R0	2
9	scrw M3*5L TAP	86.VG524.5R0	2

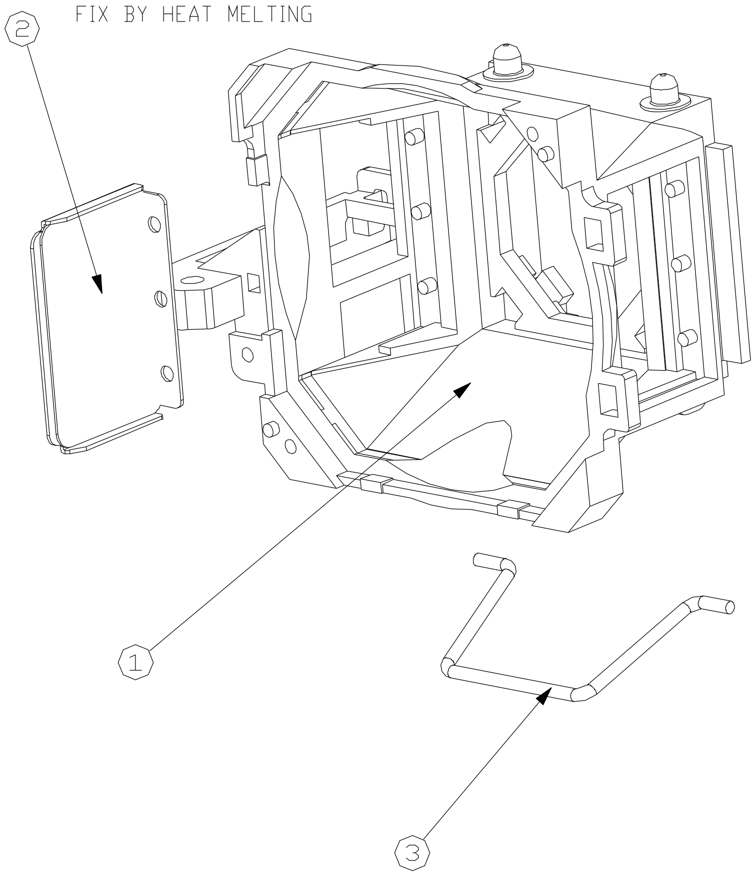
MODEL	JT30		NAME ASSY LAMP MODULE			
DRN	DAVID WONG	021105	MATERIAL			
DSN	DAVID WONG	021105	FINISH			
CKD	JIMMY SHEN	021110	SCALE	1 /	DIM IN	mm
APPD	CHRIS LI	021110	SHEET	OF	CAVITIES	

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4912.001						

PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021126

	PART NAME	PART NUMBER	Qty	
1	LAMP HOLD	42.J4926.001	1	
2	ASSY BKT MESH	60.J4916.001	1	??
3	HANDLE LAMP MODULE	33.J4917.001	1	??



MODEL	JT30		NAME ASSY LAMP HOLD			
DRN	DAVID WONG	021120	MATERIAL	NA		
DSN	DAVID WONG	021120	FINISH			
CKD	JIMMY SHEN	021122	SCALE	1 /	DIM IN	mm
APPD	CJHRIS LI	021122	SHEET	OF	CAVITIES	
Benq Corporation						

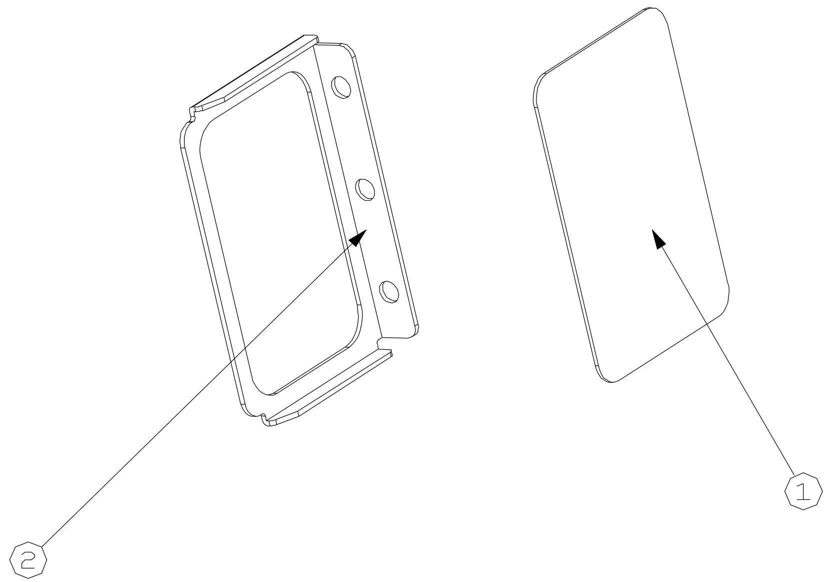
TOLERANCE UNLESS OTHERWISE SPECIFIED (±)

CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0

FILE NAME	
PART NO.	60.J4913.001

PART NO	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021126

	PART NAME	PART NUMBER	Qty
1	MESH LAMP HLD	34.J4912.001	1
2	BKT MESH	33.J4915.001	1

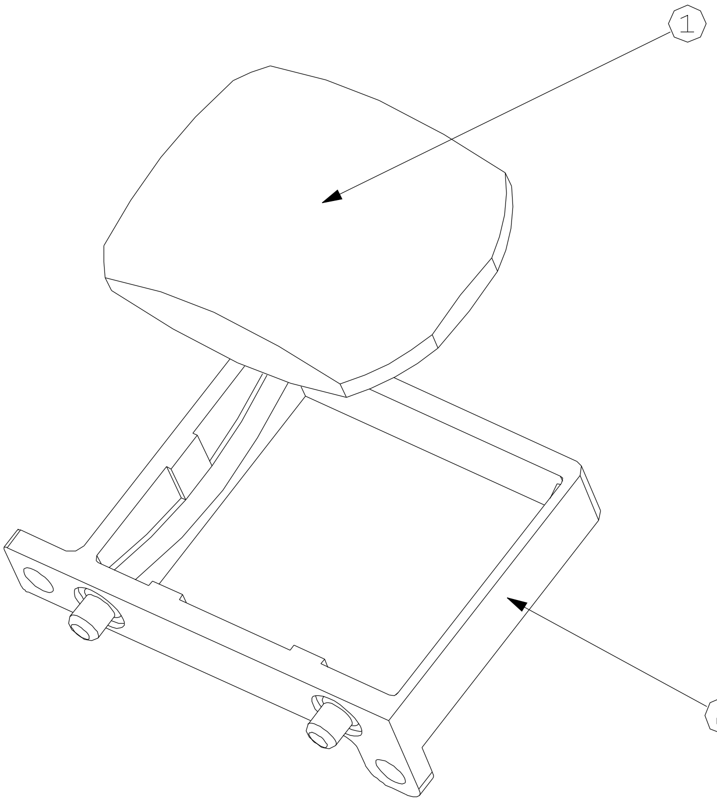


MODEL	JT30		NAME ASSY BKT MESH			
DRN	DAVID WONG	021115	MATERIAL	NA		
DSN	DAVID WONG	021115	FINISH			
CKD	JIMMY SHEN	021120	SCALE	1 /	DIM IN	mm
APPD	CHRIS LI	021120	SHEET	OF	CAVITIES	
Benq Corporation						

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME							
PART NO.	60.J4916.001						

PART NO.	REV	SYMBOL	DESCRIPTION	LOCATED	REASON	SIGN	DATE
	A		FIRST RELEASE			DAVID WONG	021127

	PART NAME	PART NUMBER	Qty
1	LENS C3	35.80J49.011	1
2	HOLD LENS C3	42.J4929.001	1



*NOTE:
PART 1 IS FIXED ON PART 2 BY GLUE 38.01043.021

MODEL	JT30		NAME	ASSY LENS C3 HOLD			
DRN	DAVID WONG	021105	MATERIAL	NA			
DSN	DAVID WONG	021105	FINISH				
CKD	JIMMY SHEN	021110	SCALE	1 /	DIM IN	mm	
APPD	CJHRIS LI	021110	SHEET	1 OF 1	CAVITIES		

Benq Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 8mm	0.05	0.1	0.1	0.2	0.2	0.4	0.4
8 ~ 25mm	0.08	0.15	0.15	0.3	0.3	0.6	0.6
25 ~ 80mm	0.12	0.2	0.25	0.4	0.5	0.8	1.0
80 ~ 250mm	0.25	0.3	0.4	0.6	0.8	1.2	1.5
250 ~ 800mm	0.5	0.6	0.8	1.0	1.5	2.0	3.0
> 800mm	1.0	1.0	1.5	1.7	3.0	4.0	6.0
ANGLE	0.5	0.5	0.5	0.5	1.0	1.0	1.0
FILE NAME	60J4918001_ASSY_C3_HOLD						
PART NO.	60.J4918.001						